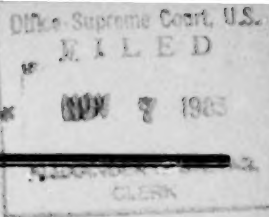


83-770

NO.



IN THE
Supreme Court of the United States
OCTOBER TERM, 1983

THE CITY OF NEW YORK and THE STATE OF NEW YORK,

Appellants,

—against—

THE UNITED STATES DEPARTMENT OF TRANSPORTATION and THE
MATERIALS TRANSPORTATION BUREAU OF THE UNITED STATES
DEPARTMENT OF TRANSPORTATION, *et al.*,

Appellees.

**APPENDICES TO JURISDICTIONAL STATEMENT FOR
APPELLANTS CITY OF NEW YORK AND STATE OF
NEW YORK**

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APPENDIX A

**Opinion and Judgment of the Court of Appeals
UNITED STATES COURT OF APPEALS**

FOR THE SECOND CIRCUIT

Nos. 415, 451—August Term, 1982

Argued: February 14, 1983 Decided: August 10, 1983

Docket Nos. 82-6094, 82-6200

THE CITY OF NEW YORK,

Plaintiff-Appellee,

—and—

THE STATE OF NEW YORK, ET AL.,

Plaintiffs-Intervenors-Appellees,

—v.—

THE UNITED STATES DEPARTMENT
OF TRANSPORTATION, ET AL.,

Defendants-Intervenors-Appellants.

Before:

OAKES, NEWMAN, and PRATT,

Circuit Judges.

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Appeal from the May 6, 1982, judgment of the District Court for the Southern District of New York (Abraham D. Sofaer, Judge) invalidating in part Department of Transportation Regulation HM-164 governing the highway transportation of large quantities of radioactive materials. 539 F. Supp. 1237 (S.D.N.Y. 1982).

Reversed and remanded.

Judge Oakes dissents.

TWILA L. PERRY, Asst. U.S. Atty., New York, N.Y. (John S. Martin, Jr., U.S. Atty., Gaines Gwathmey, III, Peter C. Salerno, Asst. U.S. Attys., New York, N.Y., Douglas Anderson, Department of Transportation, Washington, D.C., on the brief), *for defendants-appellants*.

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(PETER M. COLLINS, John G. Collins, Mid-Atlantic Legal Foundation, Inc., New York, N.Y., filed a brief on behalf of amicus curiae Scientists and Engineers for Secure Energy, Inc. and Mid-Atlantic Legal Foundation, Inc.)

(ELDON KAUL, Asst. Atty. Gen., Roseville, Min., E. Dennis Muchnicki, Asst. Atty. Gen., Columbus, Ohio, filed a brief on behalf of amicus curiae States of Ohio and Minnesota on the Relation of Their Attys. Gen. William J. Brown and Warren Spanus.)

NEWMAN, *Circuit Judge*:

Every age has experienced scientific advances. A distinguishing feature of our era is the effort the scientific community is making to quantify the risks that seem inevitably to accompany the results of technological progress. The availability of this data has doubtless played a part in raising public consciousness about the mixed blessings of "progress," and public concern has led to rigorous governmental regulation. These trends, in turn, have brought before the courts controversies that present old issues in new contexts of unusual complexity. In determining whether regulatory actions conform to statutory requirements, courts are now obliged to review agency consideration of sophisticated data concerning the potential gravity of adverse consequences and the probability of their occurrence. This assessment of risk lies at

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the heart of this appeal, which involves a challenge to a federal regulation designed to reduce the risks from the transportation of radioactive materials. The United States Department of Transportation ("DOT" or "the Department") appeals from the May 6, 1982, judgment of the District Court for the Southern District of New York (Abraham D. Sofaer, Judge) declaring invalid, in part, regulations promulgated by DOT to govern the transportation of large quantities of radioactive materials by highway. 539 F. Supp. 1237 (S.D. N.Y. 1982). For reasons set out in detail below, we reverse and remand the matter for entry of a judgment upholding the regulations.

I.

The challenged DOT regulations can best be understood in light of developments preceding their issuance. In early 1976, the City of New York amended its health code to prohibit the transportation of spent nuclear fuel and other large quantities of radioactive material through the City without a Certificate of Emergency Transport from the Commissioner of Health. See N.Y. City Health Code § 175.111(l) (Jan. 15, 1976). The amendment of the City's Health Code effectively banned the use of motor vehicles to ship spent fuel from nuclear reactors operating on Long Island because all roads from Long Island pass through New York City. Since 1976, spent nuclear fuel has been removed from Long Island by barge across the Long Island Sound to New London, Connecticut.

The Brookhaven National Laboratories, which operates a reactor on Long Island, responded to New York City's action by asking DOT to declare the amendment preempted by the Hazardous Materials Transportation Act (HMTA), 49 U.S.C. §§ 1801-1812 (1976 & Supp. V

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1981).¹ Section 105(a) of HMTA authorizes the Secretary of Transportation to promulgate rules governing the routing of shipments containing hazardous materials including radioactive materials. 49 U.S.C. § 1804(a). Section 112(a) of HMTA provides that any state or local regulation inconsistent with federal regulations is preempted. 49 U.S.C. § 1811(a).

In an "Inconsistency Ruling" published in April 1978, DOT found that HMTA did not preempt the amendment of the New York City Health Code. 43 Fed. Reg. 16,954 (Apr. 20, 1978). DOT reasoned that, although HMTA authorized the Secretary to develop national rules for the routing of nuclear materials, the Secretary had not yet exercised that authority. Consequently, in DOT's view, municipalities like New York City were free to enact their own routing rules, including extreme routing requirements such as a ban on the shipment of nuclear materials through densely populated urban areas.²

As a consequence of restrictions placed on the transportation of nuclear materials by New York City and numerous other jurisdictions across the country, DOT decided to investigate whether federal rules governing highway carriers of radioactive materials might be needed. In an Advance Notice of Proposed Rulemaking published in August 1978, DOT expressed its concern that

¹ Initially, the United States challenged the amendment to the New York City Health Code in federal court. *United States v. City of New York*, 76 Civ. 273 (IBW) (S.D.N.Y. Jan. 15, 1976). After the District Court denied the Government's motion for a preliminary injunction, the case was transferred to the suspense calendar by stipulation.

² The Inconsistency Ruling concluded that, if DOT chose to establish national routing procedures in the future, the New York City ordinance might become preempted unless the City received a non-preemption ruling from DOT, as permitted by section 112(b) of HMTA, 49 U.S.C. § 1811(b).

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the various, inconsistent safety regulations imposed by state and local authorities might in fact diminish the overall safety of the transportation of nuclear materials. See 43 Fed. Reg. 36,492 (Aug. 17, 1978). In this Advance Notice, DOT outlined several proposals for regulating the highway transportation of radioactive materials at the federal level and invited comments on these proposals as well as on the threshold question, "Should radioactive materials be subject to more stringent Federal highway routing requirements than now imposed?" *Id.* at 36,493-94.³ From the start, DOT indicated its intention to limit its proposed rulemaking to *highway* routing, which it identified as the mode of transportation that "offers the largest number of routing possibilities and the greatest access to population centers. . . . [while] fac[ing] immediate and significant disparities in safety requirements imposed by State and local jurisdictions." *Id.* at 36,492.

In the course of rulemaking proceedings mandated by the Administrative Procedure Act, 5 U.S.C. §§ 551-706 (1976 & Supp. V 1981), DOT conducted eight public hearings and received more than 1600 comments on its proposed regulation of the highway transportation of radioactive materials. In January 1980, DOT published a Notice of Proposed Rulemaking, which contained DOT's preliminary assessment of appropriate routing requirements and driver training programs. See 45 Fed. Reg. 7140 (Jan. 31, 1980). Almost a year later, DOT published a Final Rule, known as HM-164, which closely resembled the proposed version. 46 Fed. Reg. 5298 (Jan. 19, 1981) (codified at 49 C.F.R. §§ 171-173, 177 (1982)).

³ At that time, federal regulations simply stated that unless impracticable, carriers of hazardous materials should use routes that avoid heavily populated areas. 49 C.F.R. § 397.9 (1978); see 43 Fed. Reg. at 36,492-93.

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This litigation challenges the sections of the Final Rule governing the routing of motor vehicles that carry "large-quantity shipments" of radioactive materials.⁴ The Final Rule establishes a system of preferred routes comprising the highways of the Interstate Highway System supplemented by local highways selected and approved by state routing agencies.⁵ Under the Final Rule, vehicles carrying large-quantity shipments of radioactive materials should as a general matter "operate[] over preferred routes selected to reduce time in transit, except that an Interstate System bypass or beltway around a city shall be used when available." 49 C.F.R. § 177.825(b) (1982). DOT designated the entire Interstate Highway System as a preferred route because of the System's low accident rates and its capacity to reduce transit times. *See* 46 Fed. Reg. at 5300-01. However, because DOT believed that in many cases local roads might provide safer and more direct routes for highway carriers and that state authorities were better situated to determine where alternate routes would be preferable, state routing authorities were given authority to supplement the Interstate Highway System. *See id.* at 5301-02. The Rule also requires that large-quantity radioactive materials carriers prepare written route plans before shipment, that drivers for these shipments complete training programs, and that carriers moving irradiated reactor fuel follow security procedures established by the Nuclear Regulatory Commission (NRC). *See* 49 C.F.R. §§ 173.22, 177.825(c), (d), (e); *see also* 10 C.F.R. § 73 (NRC security regulations). Accompanying HM-164

⁴ "Large quantity radioactive materials" are defined in 49 C.F.R. § 173.389(b) (1982).

⁵ *See* "Guidelines for Selecting Preferred Highway Routes for Shipments of Large Quantity Radioactive Materials," 49 C.F.R. § 277.825(b)(1)(ii) (providing directions for state routing agencies).

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was an appendix expressing DOT's opinion that the Rule would preempt local regulations, such as the New York City Health Code, that "prohibit[] transportation of large quantity radioactive materials by highway between any two points without providing an alternate route for the duration of the prohibition." 46 Fed. Reg. at 5317-18 (codified at 49 C.F.R. § 177 app. A (1982)).

In conjunction with the issuance of HM-164, DOT reckoned with section 102(2)(C) of the National Environmental Protection Act (NEPA), 42 U.S.C. § 4332(2)(c) (1976), which requires a detailed Environmental Impact Statement (EIS) in every proposal for a major federal action "significantly affecting" the quality of the human environment. DOT released with HM-164 a Final Regulatory Evaluation and Environmental Assessment,⁶ which concluded that an EIS was not needed because HM-164 would not have a "significant" impact on the environment. DOT's Environmental Assessment noted that HM-164 would benefit the environment by reducing the existing level of background radiation. This benefit would result from a reduction in the transit time for shipments of radioactive materials. The Rule would also have a beneficial effect upon the risk that a shipment would be involved in a highway accident, since the interstate highway system enjoys a comparatively low accident rate.

However, the Environmental Assessment acknowledged that in one respect the Final Rule creates a risk. Permitting high-quantity shipments of spent nuclear fuel and other radioactive materials to be trucked through densely populated urban centers in jurisdictions that had previously banned such shipments creates an estimatable risk

⁶ The Department had prepared a draft Environmental Assessment to accompany its Notice of Proposed Rulemaking. See 45 Fed. Reg. at 7152 (summary of draft assessment).

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of serious consequences that would occur in the unlikely event of an accident with substantial leakage of radioactive gases. Conceding that this risk was credible, DOT concluded, on the basis of "overall risk" assessment, that this possibility did not cause HM-164 to have a "significant impact" on the environment. The concept of overall risk incorporates the significance of possible adverse consequences discounted by the improbability of their occurrence. DOT's risk assessment, which we discuss in detail in Part IV, *infra*, relied on a study estimating the probability of a catastrophic accident resulting from the highway transportation of radioactive materials through urban centers to be approximately once every 300 million years. See Nuclear Regulatory Commission, Office of Standards Development, *Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes* at v-vi (Dec. 1977) (hereinafter cited as 1977 NRC Report or NUREG-0170) (national estimate based on 1975 shipping rates); see also Sandia National Laboratories, *Transportation of Radionuclides in Urban Environments: Draft Environmental Assessment* 66 (July 1980) (hereinafter cited as Sandia Report) (study of probability of accident in New York City).

Throughout the rule-making process, the City of New York was a vocal critic of DOT's proposals and repeatedly urged DOT to broaden the scope of its inquiry and to consider barging as an alternate means of transporting large-quantity shipments of radioactive materials around urban centers that lack circumferential highways. When the Department failed to incorporate the City's barging suggestion into the Proposed Rule issued in early 1980, the City reiterated its support of barging and requested DOT to accompany the Final Rule with a non-preemption ruling for section 175.111(f) of the New

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York City Health Code. See HMTA § 112(b), 49 U.S.C. § 1811(b). The City's application for a non-preemption ruling was denied as premature. Once the Final Rule was published in January 1981, the City renewed its application for a non-preemption ruling. On January 15, 1982, fifteen days before the Final Rule went into effect, DOT sent the City a letter indicating that the City's non-preemption application would most likely not be approved for lack of substantial supporting documentation. The Final Rule went into effect on February 1, 1982.

However, orders entered in this litigation have prevented preemption of the City's regulation. On March 25, 1981, the City filed a complaint in the Southern District of New York to invalidate Rule HM-164 on numerous grounds. Shortly after the complaint was filed, the District Court granted motions by the State of New York and a group of utilities to join the proceeding as intervening plaintiff and intervening defendants, respectively. On January 29, 1982, three days before HM-164 was to take effect, the District Court issued a temporary order restraining the preemptive effect of HM-164 upon section 175-111(f) of the City's Health Code. On February 19, 1982, the District Court, in an exhaustive opinion, ruled that HM-164 violated HMTA and NEPA in its preemption of state and local bans on the transportation of large-quantity radioactive materials along highways in densely populated areas. The District Court permanently enjoined nationwide the enforcement of what it concluded was the invalid effect of HM-164, and offered the parties the opportunity to suggest corrections to the Court's opinion. Based on these suggestions, the District Court filed an amended opinion and judgment on May 6, 1982, which limited its earlier decision and invalidated

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HM-164 only insofar as it preempted New York City's Health Code. 539 F. Supp. 1237.

II.

We consider first the District Court's interpretation of HMTA, the statute under which DOT issued Rule HM-164. The District Court construed HMTA to require that regulations promulgated under the statute set the safest feasible standards for transportation of hazardous materials. In the District Court's view, HMTA regulations must maximize public safety not only for the nation as a whole, but for every local jurisdiction in the country as well. Furthermore, in the District Court's view, DOT must require shippers to use the safest of alternative modes of transportation.⁷ Applying this construction of HMTA, the Court faulted DOT for not demonstrating that HM-164 offers a safer means of transporting radioactive materials through New York City than barging these materials around the City. On this appeal, the Government and the intervening utility companies contend that HMTA does not require the Secretary to maximize safety, but rather authorizes her to set acceptable levels of safety for each mode of transportation. We agree with the appellants' interpretation of the statute.

HMTA empowers the Secretary of Transportation "to protect the Nation adequately against the risks of life and

⁷ The District Court viewed the Act as "a simple yet strong direction" for the Secretary "not only to consider alternatives to proposed regulations but also, when considering alternatives, to adopt the safer option unless it is impractical." 539 F. Supp. at 1289; see *id.* at 1290. From this mandate, the District Court concluded that it was impermissible for the Secretary to promulgate HMTA regulations that "declare a certain level of safety 'acceptable' regardless of the possibility of achieving higher levels through reasonable measures." *Id.* at 1289.

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property which are inherent in the transportation of hazardous materials in commerce." HMTA § 102, 49 U.S.C. § 1801. The reference to "adequate" protection suggests that Congress expected the Secretary to exercise discretion in determining the appropriate level of safety. This understanding of HMTA is supported by section 105 (a), which permits, but does not require, the Secretary to promulgate regulations governing "any safety aspect of the transportation of hazardous materials which the Secretary deems necessary or appropriate." 49 U.S.C. § 1804(a).

A further clue that Congress did not intend HMTA regulations to maximize public safety, particularly on a jurisdiction-by-jurisdiction basis, is the statute's regulatory structure. Under section 112(a), HMTA regulations preempt inconsistent state and local regulations. 49 U.S.C. § 1811(a). Congress included this provision "to preclude a multiplicity of State and local regulations and the potential for varying as well as conflicting regulations in the area of hazardous materials transportation." S. Rep. No. 1192, 93d Cong., 2d Sess. 37 (1974) (hereinafter cited as *Senate Report*); see *Kappelmann v. Delta Air Lines, Inc.*, 539 F.2d 165, 169-70 (D.C. Cir. 1976), *cert. denied*, 429 U.S. 1061 (1977); *Consolidated Rail Corp. v. City of Dover*, 450 F. Supp. 966, 973-74 (D. Del. 1978); see also *National Tank Truck Carriers, Inc. v. City of New York*, 677 F.2d 270, 275 (2d Cir. 1982). To ameliorate the sweep of section 112(a), Congress wrote into HMTA a procedure whereby local jurisdictions could apply for non-preemption rulings for their own regulations. See HMTA § 112(b), 49 U.S.C. § 1811 (b). A local jurisdiction qualifies for a non-preemption ruling if it can demonstrate to DOT that its local regulation "affords an

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equal or greater level of protection to the public" than that of DOT's regulations, and "does not unreasonably burden commerce." *Id.* This non-preemption procedure was added to HMTA so that in "certain exceptional circumstances" DOT could limit the preemptive force of federal regulations "to secure more stringent regulations" by local authorities. *Senate Report, supra*, at 38. It is difficult to understand why Congress would have added a non-preemption procedure to permit safer local regulations if the statute required the Secretary to adopt only those HMTA regulations that would maximize public safety on a jurisdiction-by-jurisdiction basis.

The District Court's construction of HMTA would place tremendous, if not insuperable, constraints on the Secretary's rule-making power in the absence of explicit statutory direction. Undoubtedly, Congress has (and occasionally uses) the authority to instruct a federal agency to regulate an area so as to maximize a public benefit or minimize a public harm. *See, e.g.*, 33 U.S.C. § 1314(b)(2)(B) (1976) ("best measures and practices available to comply with" effluent limitations). But courts should not strain to infer from vague statutory language or legislative committee rhetoric a goal of maximizing a particular public policy. *See FCC v. WNCN Listeners Guild*, 450 U.S. 582, 593-95 (1981); *INS v. Wang*, 450 U.S. 139, 144 (1981) (per curiam). *See Note, Intent, Clear Statements, and the Common Law: Statutory Interpretation in the Supreme Court*, 95 Harv. L. Rev. 892, 910-12 (1982).

The District Court's interpretation of HMTA would also require the Department to compare modes of transportation to determine which mode is the safest, thereby pitting the various modes of transportation in direct

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competition because only one mode of transportation can be the safest mode for any given task. We do not believe that Congress imposed such a requirement.

Before HMTA was passed in 1974, a number of federal agencies, including the Federal Highway Administration and the Federal Railway Administration, supervised the transportation of hazardous materials. The Secretary of Transportation maintained a small technical staff to advise these agencies, *see* Hazardous Materials Transportation Control Act of 1970, Pub. L. No. 91-458, §§ 301-303, 84 Stat. 971, 977 (repealed 1974), but DOT had no substantive control over the various modes of transportation. Consequently, there was no coordinated regulation of the various modes.

In 1974, Congress passed HMTA to "draw[] the Federal Government's now-fragmented regulatory and enforcement power over the movement of hazardous materials in commerce into one consolidated and coordinated effort under the direction of the Secretary of Transportation." *Senate Report, supra*, at 1. For the first time, a single federal authority had the responsibility for overseeing the transportation of hazardous materials by all modes. This centralization was designed to achieve a comprehensive approach to reducing risk, for example, by ensuring that consistent packaging rules were enforced for all modes. *See id.* at 2.

Because HMTA consolidated federal regulatory control, the District Court inferred that the Act required the Secretary to permit the use of only the safest mode for any function. Such a requirement would constitute a radical shift in regulatory policy with serious ramifications for the transportation industry. In the past, we have been extremely reluctant to hold Congress to have made such a basic change in regulatory procedure absent ex-

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PLICIT statutory language or other clear manifestation of congressional intent. *Toilet Goods Ass'n v. Finch*, 419 F.2d 21, 27 (2d Cir. 1969). None of the provisions of HMTA remotely suggests that the Act was intended to mandate comparisons among modes of transportation. To the contrary, the House Committee made it clear that the Act would not change the Secretary's regulatory authority. See H. Rep. No. 1083, 93d Cong., 2d Sess. 20 (1974), reprinted in 1974 U.S. Code Cong. & Ad. News 7669, 7680. We conclude, therefore, that in passing HMTA Congress intended DOT to use its centralized authority to develop a rational and consistent system of regulations for all modes of transportation, but expected that the Department would continue to follow the prior practice of regulating each mode of transportation on an individual basis.⁸

Having rejected the District Court's construction of HMTA, we now reach the question of what standards HMTA sets to govern the Secretary's rule-making authority. In our view, HMTA regulations are valid as long as they are rationally related to the policy—the development of acceptable levels of public safety for each mode of transportation—underlying HMTA and are promulgated in accordance with the Administrative Procedure Act, 5 U.S.C. §§ 551-706 (1976 & Supp. V 1981). DOT fully complied with these standards. DOT followed appropriate notice and comment procedures, and the Final Rule was rationally related to the goal of developing acceptable levels of safety in the highway transportation of radioactive materials. Except for claims premised on an erro-

⁸ In so ruling, we do not mean to imply that DOT cannot prohibit the transportation of certain classes of hazardous materials by one particular mode if the Department concludes that there is no practical means of regulating that mode to ensure an acceptable level of safety.

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neous interpretation of HMTA, we do not understand the plaintiffs to dispute that HM-164 is a valid HMTA regulation.

III.

We next consider the District Court's conclusions that DOT failed to comply with the requirements of NEPA. We discuss in this part the Court's conclusion that by giving insufficient attention to bargaining as an alternative to HM-164 nationwide and for New York City in particular, DOT failed to consider alternatives to proposed agency action as required by NEPA. In Part IV, *infra*, we consider the Court's ruling that DOT erred in assessing HM-164 not to have a "significant" environmental impact.

Section 102(E) of NEPA obliges agencies to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." The Secretary suggests preliminarily that HM-164 does not even encounter this requirement because it does not propose a "use" of a "resource" within the meaning of section 102(2)(E). This Court, however, has not construed section 102(2)(E) narrowly to apply only to agency actions that propose an identifiable use of a limited resource like park land or fresh water.⁹ Instead, we have ruled that federal agencies have a duty under NEPA to study alternatives to any actions that have an impact on the environment, even if the impact is not significant enough to require a full-scale EIS. *Hanly v.*

⁹ Arguably, HM-164 satisfies the literal meaning of section 102(2)(E) since the movement of radioactive materials along highways can be considered a "use" of the surrounding air.

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Kleindienst, 471 F.2d 823, 834-36 (2d Cir. 1972), *cert. denied*, 412 U.S. 908 (1973); see *Trinity Episcopal School Corp. v. Romney*, 523 F.2d 88, 93 (2d Cir. 1975).

HM-164 is an agency action with some impact on the environment. The Rule establishes the manner in which highly toxic substances will be moved around the country. Even apart from the risk of a possible accident, the permitted transportation will cause some contribution to the amount of low-level radiation on the interstate highway system. Under the standards developed in *Hanly v. Kleindienst*, *supra*, and *Trinity Episcopal School Corp. v. Romney*, *supra*, we conclude that HM-164 has sufficient impact on the environment to require DOT to consider alternatives to the action.

This general conclusion, however, does not determine what sort of alternatives DOT had to consider in its Environmental Assessment and, in particular, whether the Department should have studied barging as an alternative to applying HM-164 to New York City.¹⁰ As the Supreme Court has recognized, an agency's duty to consider alternatives under NEPA is "not self-defining." See *Vermont Yankee Nuclear Power Corp. v. National Resources Defense Council, Inc.*, 435 U.S. 519, 551 (1978).

In the first instance, the agency itself is responsible for determining the range of alternatives to be considered, *North Slope Borough v. Andrus*, 642 F.2d 589, 601 (D.C. Cir. 1980), and is supposed to follow what the District of Columbia has called a "rule of reason," *Natural Re-*

¹⁰ Two different NEPA provisions deal with the analysis of alternatives. Section 102(2)(E), 42 U.S.C. § 4332(2)(E), is the more general provision, applicable even when an agency need not prepare a complete EIS. See *Hanly v. Kleindienst*, *supra*, 471 F.2d at 834-35 (discussing previously numbered section 102(2)(D)). Section 102(2)(C)(iii), 42 U.S.C. § 4332(2)(C)(iii), requires a more detailed statement on alternatives to the proposed action, but only applies when an EIS is required.

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sources Defense Council, Inc. v. Morton, 458 F.2d 827, 834 (D.C. Cir. 1972). An agency's selection of alternatives, however, is not insulated from review. See *County of Suffolk v. Secretary of Interior*, 562 F.2d 1368, 1375 (2d Cir. 1977), *cert. denied*, 434 U.S. 1064 (1978). While an agency is not obliged to consider every alternative to every aspect of a proposed action, see *Environmental Defense Fund, Inc. v. Corps of Engineers*, 492 F.2d 1123, 1134-36 (5th Cir. 1974), *aff'd*, 376 F.2d 573 (5th Cir. 1978); *East 63rd Street Ass'n v. Coleman*, 414 F. Supp. 1318, 1326 & n.18 (S.D.N.Y. 1976); *Inman Park Restoration Inc. v. Urban Mass Transportation Administration*, 414 F. Supp. 99, 115 (N.D. Ga. 1976), reviewing courts have insisted that the agency "consider such alternatives to the proposed action as may partially or completely meet the proposal's goal." *Natural Resources Defense Council, Inc. v. Callaway*, 524 F.2d 79, 93 (2d Cir. 1975). Moreover, an agency will not be permitted to narrow the objective of its action artificially and thereby circumvent the requirement that relevant alternatives be considered. See *id.*; *Committee to Stop Route 7 v. Volpe*, 346 F. Supp. 731, 739-41 (D. Conn. 1972).

The scope of alternatives to be considered is a function of how narrowly or broadly one views the objective of an agency's proposed action. In this case, for example, if DOT's objective is to improve the safety of highway transportation of radioactive materials, relevant alternatives might include a choice of routes, a choice of equipment, and a choice of driver qualifications. If DOT is concerned more broadly with all transportation of these materials, it might consider alternative modes of transportation. If the objective is viewed still more broadly as reducing the hazards of radiation exposure, the Department might consider alternative sources of power that

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could reduce the generation of spent nuclear fuel. Frequently, a pertinent guide for identifying an appropriate definition of an agency's objective will be the legislative grant of power underlying the proposed action. See Picher, *Alternatives Under NEPA: The Function of Objectives in an Environmental Impact Statement*, 11 Harv. L. Legis. 595 (1974); Comment, *The National Environmental Protection Act of 1969: What "Alternatives" Must an Agency Discuss?*, 12 Colum. J.L. & Soc. Probs. 221, 241-50 (1976). Statutory objectives provide a sensible compromise between unduly narrow objectives an agency might choose to identify to limit consideration of alternatives and hopelessly broad societal objectives that would unduly expand the range of relevant alternatives. We implicitly endorsed the pertinence of statutory objectives in ruling that an agency need not consider "alternatives which could only be implemented after significant changes in government policy or legislation." *Natural Resources Defense Council, Inc. v. Callaway*, *supra*, 524 F.2d at 93.¹¹

Having described the nature of an agency's duty to consider alternatives, we now consider whether DOT satisfied that duty in this case. The Environmental Assessment prepared for HM-164 was a thirty-six page document supplemented by nine technical appendices. The Assessment covered nine alternatives, including a no-action alternative. All of the alternatives concerned highway transportation of radioactive materials. The two

¹¹ This view is at odds with cases such as *Natural Resources Defense Council, Inc. v. Morton*, *supra*, in which the District of Columbia Circuit set aside a rule governing natural gas exploration because the rule's EIS did not consider energy conservation as an alternative. The Court viewed conservation as a cognizable alternative to the societal objective behind the agency's action—meeting the nation's energy requirements.

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principal alternatives involved routing shipments around heavily populated areas, except for pickup and delivery, and, as HM-164 proposed in modified form, routing the materials via interstate highways, except for pickups and deliveries. The Assessment also considered requiring advance notice of large-quantity shipments as well as preparation of after-the-fact routing plans for these shipments. Finally, the Assessment considered time-of-day or time-of-week routing restrictions and specialized driver training programs for large-quantity shipments.

The District Court's basic criticism of the Environmental Assessment was the absence of any serious consideration of the barging alternative. At various points in its opinion, the District Court seems to suggest that DOT should have considered barging as a nationwide alternative to trucking radioactive materials through densely populated areas. *See, e.g.*, 539 F. Supp. at 1282. More often, however, Judge Sofaer makes clear that he was primarily concerned with DOT's failure to consider barging as an alternative for New York City. *See id.* at 1281, 1287. This fundamental complaint was also directed at the Assessment's treatment of the no-action alternative because, had DOT failed to promulgate HM-164, barging would have been the inevitable consequence in some jurisdictions, such as New York City. *See id.* at 1279.

Though we have required an agency to give some consideration to alternatives even though preparation of an EIS is not required, *Hanly v. Kleindienst, supra*, 471 F.2d at 834-36, it remains something of an anomaly to insist that an agency assess alternatives for an action that it has determined will not have a "significant" effect on the environment. *See id.* at 836-37 (Friendly, J., dissenting). But even accepting the teaching of *Hanly*, as we must, we are of the view that an agency's finding of no

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significant impact, if otherwise valid, permits the agency to consider a narrower range of alternatives than it might be obliged to assess before undertaking action that would significantly affect the environment. In this case, DOT's finding that HM-164 would not significantly affect the environment substantially diminishes the claim that the Department acted arbitrarily in declining to consider barging as a national alternative.

The claim is further undermined when we consider the statutory objective HM-164 was fulfilling. As we discussed in Part II, *supra*, HMTA authorizes the Secretary to promulgate regulations that establish acceptable national levels of public safety for each mode of transportation of hazardous materials. With HM-164, DOT consciously limited itself to studying and establishing national regulations for highway carriers, leaving for some future date the investigation of other modes of transportation. See 43 Fed. Reg. at 36,492. Since HMTA neither requires nor envisions that DOT will compare modes of transportation before issuing safety regulations, DOT was acting within its statutory mandate in limiting its inquiry to highway transportation. Even if barging offered a nationwide alternative to highway transportation, which seems unlikely,¹² barging was not an alternative to DOT's statutorily imposed objective of creating national safety regulations for highway transportation.

A third consideration that weighs heavily against requiring DOT to consider barging as a national alternative is the availability of the procedure for obtaining a non-preemption ruling. Of course, it was open to DOT to consider including in HM-164 a provision requiring (or at

¹² Twenty-six percent of the nation's nuclear facilities are reportedly not directly accessible to navigable waters. See NUREG-0170, *supra*, at 6-9.

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least permitting local preference for) barging in those circumstances where this alternative could safely and conveniently avoid highway transportation through urban centers. But the opportunity for a non-preemption ruling will enable the Department to give adequate consideration to the barging alternative in those areas where local circumstances might warrant it.

There is even less justification for requiring DOT to consider in its Environmental Assessment barging only around New York City. As a site-specific solution, barging around New York City offered no reasonable alternative to a nationwide regulation for highway transportation. Moreover, to fault DOT for not considering a barging alternative to New York City would imply that the Department should have made similar comparisons of transportation modes for numerous other jurisdictions. Enlarging the duty to consider alternatives to this degree would make it virtually impossible for an agency to promulgate national regulations like HM-164. *See East 63rd Street Ass'n v. Coleman, supra; Inman Park Restoration, Inc. v. Urban Mass Transportation Administration, supra.*

The availability of a non-preemption ruling is, in any event, a complete answer to the claim that DOT was required in its Environmental Assessment to consider the barging alternative specifically for New York City. When an agency undertakes a national regulatory scheme like HM-164 and adopts procedures permitting localized environmental alternatives to be considered at a later date, we will not fault the agency for not considering these particular alternatives in its original Environmental Assessment. *See County of Suffolk v. Secretary of Interior, supra*, 562 F.2d at 1378.

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In sum, we conclude that DOT did not violate NEPA by omitting from its Environmental Assessment consideration of bargaining as an alternative to HM-164 either for the nation as a whole or for New York City.

IV.

We turn now to the core issue: whether DOT violated NEPA by determining in its Environmental Assessment that HM-164 did not require preparation of an EIS because it was not an action that would "significantly" affect the environment. The District Court did not rule that an EIS was required. Instead, Judge Sofaer concluded that the Environmental Assessment was flawed in its consideration of *whether* HM-164 would "significantly" affect the environment. Though he strongly intimated that DOT would be obliged to conclude that an EIS was required, once it remedied the shortcomings that he perceived in the Assessment, his ruling faulted the sufficiency of the Assessment, not the absence of an EIS. In Judge Sofaer's view, the Assessment was deficient in its failure to reckon with numerous factors affecting the determination of how much risk HM-164 would create. Like Judge Sofaer, we approach the matter with an intuitive reaction that the transportation of radioactive materials through the cities of America poses risks that warrant careful consideration. However, after reviewing DOT's analysis of the risks and the studies the Department relied upon, in light of the standards circumscribing our role, *see Baltimore Gas & Electric Co. v. Natural Resources Defense Council, Inc.*, 51 U.S.L.W. 4678 (U.S. June 6, 1983), we conclude that the Department did not violate NEPA in deciding that an EIS was not required.

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DOT undertook the Assessment to consider environmental ramifications of a national rule. The Assessment confronted the question of what effect HM-164 or possible alternatives to HM-164 would have on the environmental quality of the nation as a whole. The "no-action" alternative against which HM-164 and its alternatives were compared was not a national environment free of radioactive materials, but a national environment *with* radioactive materials and *without* comprehensive federal regulations governing their transportation by highway. DOT's task in preparing the Environmental Assessment was complicated by the fact that the various options under consideration could not be tested against a single measure of environmental safety. In fact, for each alternative, the Department had to assess two distinct radiological risks: the effect of transporting radioactive materials on the level of background radiation and the risk that such transportation might result in accidents with the potential of causing serious damage.

Studies considered by DOT estimated the total annual dose of background radiation in the United States to be 40,000,000 rems. Of this total, transportation of radioactive materials, prior to HM-164, contributed 24,360 rems, less than one-tenth of one percent of the total dose. One measure of the relatively slight health hazard presented by such transportation is the estimate in NUREG-0170 that this background dose can be expected to cause an average of 3.07 latent cancer fatalities per year.¹³ DOT's Environmental Assessment considered the estimated impact upon background radiation of two basic trucking alternatives: routing all large-quantity shipments of radioactive mate-

¹³ A latent cancer fatality is a death that results from exposure to radiation, that occurs more than a year after the exposure, and that would not have occurred in the absence of the exposure.

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rials around heavily populated areas, except for pickups and deliveries, and routing such shipments on interstate highways, except for pickups and deliveries. The first option, avoiding population centers, was estimated by NUREG-0170, which DOT relied on, to reduce background radiation by 15.1 rems per year, which reduces latent cancer fatalities by an average of .002 per year. The "interstate" option, which HM-164 adopted in modified form, was estimated in the same study to reduce background radiation by 10.7 rems per year, which reduces latent cancer fatalities by an average of .0013 per year. None of the plaintiffs seriously claims that the impact of HM-164 on background radiation levels—actually a slight improvement—constitutes a "significant" environmental effect.

What attracted the concern of the plaintiffs and of the District Judge was the risk that highway transportation of radioactive materials through urban centers might result in an accident of potentially serious dimensions. This possibility requires an analysis somewhat different from that undertaken in other NEPA cases. If the proposed agency action is the construction of a highway or the dredging of a harbor, some adverse environmental effects are certain to occur, such as destruction of park land or disturbance of animal or fish feeding grounds. Actions of this sort may also pose risks of other consequences that can only be estimated, but normally the seriousness of the certain consequences provides an adequate basis for determining that the effect on the environment will be sufficiently significant to require an EIS. In this case, however, the certain consequences are not at all significant. It is only the risk of accident that might render the proposed action environmentally significant. That circumstance obliges the agency to undertake risk assess-

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ment: an estimate of both the consequences that might occur and the probability of their occurrence.¹⁴

DOT's Environmental Assessment faced up to this task. The Assessment initially noted the accident risk posed by highway transportation of radioactive materials by all modes of transportation in the absence of HM-164. The Assessment relied on the NUREG-0170 study, which used two measures of risk. First, the study estimated the average number of latent cancer deaths per year that could be expected from all types of accidents occurring during transportation of radioactive materials. The average figure was .017 deaths per year. Considerable perspective on this estimate is provided by comparing it to the 3.07 deaths per year estimated to result from the background radiation caused by transportation of radioactive materials. The background radiation risk is 181 times greater than the accident risk. The study's second measure of risk estimated the probability of a transporta-

¹⁴ We recognize that in a sense all evaluations mandated by NEPA are predictions about the future. The Act is concerned with the future effects of proposed agency actions, *Scientists' Institute for Public Information, Inc. v. Atomic Energy Commission*, 481 F.2d 1079, 1088-89 (D.C. Cir. 1973); *Morningside Renewal Council, Inc. v. United States Atomic Energy Commission*, 482 F.2d 234, 241-42 (2d Cir. 1973) (Oakes, J., dissenting), *cert. denied*, 417 U.S. 951 (1974). Nevertheless, there is a difference between assessing the future consequences of agency actions that "will affect the environment," *Scientists' Institute, supra*, 481 F.2d at 1089, and assessing the risk that proposed actions might have environmental effects, especially in the event of accidents. The fact that effects are only a possibility does not insulate the proposed action from consideration under NEPA, but it does accord an agency some latitude in determining whether the risk is sufficient to require preparation of an EIS. "[A] reviewing court must remember that the Commission is making predictions, within its area of special expertise, at the frontiers of science. When examining this kind of scientific determination, as opposed to simple findings of fact, a reviewing court must generally be at its most deferential." *Baltimore Gas & Electric Co. v. National Resources Defense Council, Inc.*, *supra*, 51 U.S.L.W. at 4682.

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tion accident in any one year of sufficient seriousness to cause one or more early fatalities.¹⁵ The annual probability was 9.12×10^{-4} . In other words, the Department estimated that an accident of sufficient seriousness to cause one or more early fatalities would occur approximately once every thousand years.

The Assessment then considered the impact upon accident risk of the two principal trucking alternatives for large-quantity shipments. The alternative of avoiding urban centers was estimated to cause a slight *increase* in the accident risk because this alternative entails circuitous travel on less safe secondary routes. The increase in latent cancer deaths from an accident was estimated to be .00031 per year and the increase in annual probability of an accident causing one or more early fatalities was estimated to be $.37 \times 10^{-4}$. The interstate alternative, adopted by HM-164, was estimated to *reduce* latent cancer fatalities from an accident by .00062 per year and to *decrease* the annual probability of an accident causing one or more early fatalities by $.9 \times 10^{-4}$.

The assessment also considered the consequences and probabilities of a "worst case" accident, relying on a study prepared for the NRC by Sandia Laboratories. See Sandia Report, *supra*. This study estimated the consequences of trucking accidents in New York City that would result in the maximum credible release of radioactive materials. The study estimated that the most lethal credible accident would be one involving plutonium shipments, which could cause 5 early fatalities, 1800 latent cancer fatalities, and 290 early morbidities (non-fatal

¹⁵ An early fatality is a death that results from radiation exposure, that occurs soon after the exposure or at least within one year of the exposure, and that would not have occurred in the absence of the exposure.

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injuries within a year). *Id.* at 66. The accident with the most severe economic impact would be one involving polonium, which could cause up to \$9 billion in damages, primarily from reduced value of affected land. *Id.* However, notwithstanding the seriousness of these consequences, the Sandia Report concluded, "Since these accidents have very low probabilities of occurrence, they do not contribute significantly to expected values of risk." *Id.* at 68. The NRC reached the same conclusion when it estimated that the probability of such a "worst case" accident occurring throughout the country in any year was 3×10^{-9} , based on 1975 shipment figures, approximately once every 300 million years. See NUREG-0170, *supra*, at v-vi.

Based on the Department's overall risk assessment, the interstate alternative appeared to offer a cost-efficient solution to the transportation of large-quantity radioactive materials, achieving high levels of overall safety by requiring trucks to stay on the fast and relatively safe interstate highway system. However, the interstate alternative would permit trucks carrying large-quantity radioactive materials to travel through densely populated areas where a "worst case" accident with serious consequences was theoretically possible, although the probability was infinitesimal. Recognizing this theoretical risk, DOT modified the interstate alternative to require trucks carrying large-quantity shipments to use circumferential interstate highways around urban centers whenever possible. HM-164 also authorizes states to propose preferred local highways where interstate beltways are not available. In addition, the Rule requires drivers of large-quantity shipments to complete training courses designed to enhance safety and reduce the risk of accident. Having selected the interstate alternative with these modifica-

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tions, DOT concluded, "The probability that a 'worst case' accident could occur is computed to be so low that when multiplied by even extraordinarily high consequences, the overall risk figure remains low," in DOT's view, so low that HM-164 would not have a "significant" impact on the human environment.

Though rejecting the adequacy of the Environmental Assessment, the District Court did not quarrel with DOT's methodology. Judge Sofaer agreed that the Department was entitled to calculate overall risk by estimating possible consequences and then discounting them by the improbability of their occurring. However, he was critical of the manner in which the Department applied this methodology to the risk of high-consequence accidents. Judge Sofaer's criticisms were three-fold: the Department had insufficiently analyzed the probability of a high-consequence accident; second, the Department had not fully discussed the consequences of such an accident; and finally, the Department had impermissibly considered the risk of a worst-case accident insignificant simply because the chances of such an accident are extremely low.

The issue we face is whether the District Court subjected the Environmental Assessment to a more exacting and intrusive review than is permissible under NEPA. NEPA establishes procedural requirements designed to infuse environmental considerations into the Government's decision-making processes. *See Strycker's Bay Neighborhood Council, Inc. v. Karlen*, 444 U.S. 223, 227-28 (1980) (per curiam); *County of Suffolk v. Secretary*, *supra*, 562 F.2d at 1383. However, the Act mandates no particular substantive outcomes, and courts reviewing agency compliance with NEPA are limited to determining whether "the agency has taken a 'hard look' at the environmental

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consequences." *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21 (1976). When an agency determines that a particular action will have no significant impact on the environment, a court may reject that determination only if it is arbitrary, capricious, or an abuse of discretion. See *Morningside Renewal Council, Inc. v. United States Atomic Energy Commission*, 482 F.2d 234, 238 (2d Cir. 1973), *cert. denied*, 417 U.S. 951 (1974); *Hanly v. Klein-dienst, supra*, 471 F.2d at 829-30.

In its criticisms of DOT's Environmental Assessment, the District Court took the Department to task for its treatment of highly technical matters relating to the probability, consequences, and overall risk of one particular facet of a rule that indisputably enhances safety on a nationwide basis. At this level of technical detail within a national rule-making process, errors in computation or shortcomings in analysis would have to be extraordinarily grievous to justify the District Court's conclusion that the errors and omissions render the agency's overall assessment arbitrary and capricious. Examining separately the District Court's critique of DOT's assessment of probabilities, consequences, and overall risk of high-consequence accidents, we see no legal infirmity in DOT's conclusion.

A. Probabilities

The District Court did not disagree with the Department's basic assessment of probabilities: "DOT's conclusion that high-consequence accidents are very unlikely is supported by the record." 539 F. Supp. at 1265. However, the Court faulted the Department's probability assessment because it rested on several preliminary estimates that were themselves subjects of some dispute. For in-

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stance, experts disagreed about the number of large-quantity shipments that would occur in the future. In addition, there was some controversy over the Department's assumptions about cask integrity during an accident. The District Court was also concerned that the Department did not fully consider the manner in which human error might affect its probability estimates. Finally, the Court criticized the Department for not explicitly dealing with the degree to which the risks of sabotage might affect the probability of a high-consequence accident.

Number of Shipments. Not surprisingly, experts disagree over how many shipments of large-quantity radioactive materials will be made in the future. In 1977, the NRC study known as NUREG-0170 predicted that there would be 1,911 shipments a year by 1985. See NUREG-0170, *supra*, at A-20 to -23; 539 F. Supp. at 1266. In 1979, another government report estimated that there would be no more than 641 such shipments in 1985. See *Report to the President by the Interagency Review Group on Nuclear Waste Management* (1979) (hereinafter cited as IRG Report). Other sources noted by the District Court indicate that as many as 2,500 shipments may be made annually in 1985. See 539 F. Supp. at 1267 & n.9. Faced with this uncertainty, DOT based its calculations on the relatively conservative 1977 NRC study. At various points in the Environmental Assessment, the Department recalculated its projections using the lower IRG Report.

The District Court faulted DOT's adoption of the NRC figures, supplemented by the IRG Report estimate, on the ground that the Department failed to discuss "the great uncertainties that exist on this subject and the possibility that the number of such shipments will increase exponen-

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tially" *Id.* at 1267. Apparently, the District Court concluded that the uncertainties inherent in projecting shipment rates were sufficiently severe that the Department had to discuss the matter in its Environmental Assessment.¹⁶

We do not accept this conclusion. The Department conservatively selected a projection that was on the high side of the various estimates. The highest estimates for 1985 reveal shipment levels only slightly more than 25 percent greater than the ones accepted by the Department. Inasmuch as these projections would have to be off by several orders of magnitude before there would be any substantial impact on the probability of a high-consequence accident, the Department cannot be faulted for not discussing the relatively minor difference among experts in predicting 1985 shipment levels. Certainly the Department did not act arbitrarily in failing to engage in such a discussion.¹⁷

Cask Reliability. The District Court also criticized the Department for commenting in its Advance Notice of Proposed Rulemaking that "packaging, in a severe transportation accident, would be expected to survive without any significant release of its contents." 45 Fed. Reg. at

¹⁶ In a footnote, the District Court contends that DOT erred in interpreting projections in the IRG report. See 539 F. Supp. at 1267 n.8. Even if this criticism were well taken, it would not affect the Department's Assessment, which was based on the more conservative figures developed in the 1977 NRC study.

¹⁷ The District Court also faults DOT for using historical accident rates to corroborate its projections. See 539 F. Supp. at 1267-68. The Court felt that the use of these rates was improper because, elsewhere, the Department had conceded that the figures were not wholly reliable. While it might have been arbitrary for the Department to base its entire analysis on statistics of doubtful validity, it was not improper for it to introduce these figures to double check estimates derived through independent means.

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7143. While Judge Sofaer did not label this comment as arbitrary, *see* 539 F. Supp. at 1268-69, he noted that several commentators had found the risks of cask failure more severe, and he suggested that the Department should have discussed the conflicting evidence at greater length. *Id.*

We think that DOT's assessment was well supported by two of the most complete studies on the transportation of radioactive materials. In particular, the NUREG-0170 study explicitly discussed cask reliability and explained why it found the risk of cask failure to be slight. *See* NUREG-0170, *supra*, at 5-20 to -21. As the District Court noted, in light of this scientific support, the Department's conclusion as to cask reliability was not arbitrary. Accordingly, it should not be susceptible to attack on judicial review.

Human Error. The District Court also faulted DOT for relying on probability assessments that "fail to take into account the potential effect of human error." 539 F. Supp. at 1269. This objection stems from the Court's concern that the Department unreasonably underestimated the likelihood of high-consequence accidents by assuming that every shipment of large-quantity radioactive materials would be packaged and handled without human error. The Court apparently feared that inevitable human mistakes would make large-quantity shipments more susceptible to leakage and contamination during an accident than the Department had assumed. *Id.*

This criticism is unjustified. Both the NUREG-0170 study and the 1980 Sandia Report analyzed the impact of human error. As the District Court noted, the Sandia Report devoted a chapter to the subject, *see* Sandia Report, *supra*, at 71-84, and the NRC also discussed the

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matter under the heading of "Abnormal Transport Occurrences," NUREG-0170, *supra*, at 4-31 to -33. The NRC report indicated that human errors compromise cask integrity in only a small fraction of shipments. Since large-quantity shipments are packed in such massive containers, human error is even less likely to affect overall package integrity of these shipments. *Id.* at 4-44 to -48. The Sandia Report agreed that "[m]ost human errors do not produce compromises of package integrity." Sandia Report, *supra*, at 15. In light of the extremely low probability that any cask involved in a truck accident would also be compromised by human error, it does not seem to be reasonable to criticize DOT for not factoring this contingency into its calculations. Moreover, the Department corroborated its probability estimates by looking to the historic accident rates. Since the effect of human error is inevitably included in the historic rate of accidents, the Department, at least implicitly, considered human error in its probability assessment. For a source of risk this insignificant, implicit consideration was adequate.

Sabotage Risks. In its advance Notice of Proposed Rulemaking, DOT acknowledged that many observers had expressed concern over the possibility that saboteurs or terrorists might disrupt nuclear shipments and precipitate high-consequence accidents. The Department declined to assess this possibility on jurisdictional grounds:

Development of the current DOT proposal reflects existing arrangements between DOT and NRC wherein NRC exercises responsibility for any necessary physical security requirements during transportation. The DOT proposal is therefore directed at reducing impacts associated with normal and accident situa-

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tions arising in transportation, while NRC is concerned with preventing malicious or deliberate release of radioactive materials.

45 Fed. Reg. at 7144. In 1979, the NRC had promulgated interim security rules governing the transportation of irradiated fuels, *see* 10 C.F.R. §§ 73.25-.37 (1982). The Department's sole response to the threat of sabotage was to propose extending the NRC regulations to shippers outside the NRC's jurisdiction.

The District Court had no complaint with DOT's decision to defer to the NRC as the appropriate agency for supervising matters of physical security. Nevertheless, Judge Sofaer felt that the Department should have included a discussion of sabotage in its assessment of the probability of high-consequence accidents. Under regulations of the Council on Environmental Quality, agencies should consider "[t]he degree to which the possible effects on the human environment are highly uncertain or involve unique or known risks." 40 C.F.R. § 1508.27(b)(5) (1982); *see* DOT Order 5610.1C (Sept. 18, 1979). Both the Sandia Report and the NRC have accepted that sabotage presents a real although unquantifiable risk for the transportation of large-quantity radioactive materials. *See* Sandia Report, *supra*, at 85 ("Sabotage involves human motivations and the probability of human actions which are unquantifiable with our present knowledge."); 45 Fed. Reg. 37,402 (1980) ("[E]stimates of the probability of successful sabotage of spent fuel shipments cannot be made with any confidence."). However, other experts have insisted that sabotage-induced, high-consequence accidents are "essentially impossible." NUREG-0170, *supra*, at 7-2. The District Court concluded, "[G]iven the conflicts in the underlying data, [DOT] was obligated to

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state its view on the probability of such an event, even if that view was only that no estimate could reasonably be made." 529 F. Supp. at 1271.

With respect to environmental consequences that are only remote possibilities, an agency must be given some latitude to decide what sorts of risks it will assess. See *Natural Resources Defense Council, Inc. v. NRC*, 685 F.2d 459, 516, 540-45 (D.C. Cir. 1982) (Wilkey, J., dissenting), *rev'd*, 51 U.S.L.W. 4678 (U.S. June 6, 1983). Here DOT simply concluded that the risks of sabotage were too far afield for consideration. To a large degree this judgment was justified by the record. Substantial evidence indicated that sabotage added nothing to the risk of high-consequence accidents. Even the least sanguine commentators could say only that sabotage added an unascertainable risk. In light of these conflicting points of view, it was within DOT's discretion not to discuss the matter further beyond adopting the NRC security requirements.

B. Consequences

Physical Consequences. Despite the discussion of high-consequence accidents in the Environmental Assessment and the Department's references to more detailed analyses of the subject, the District Court found that the Department had treated the subject arbitrarily: "[I]n over a period of about five years, estimates of the consequences of the most severe accident have escalated dramatically. DOT must address these uncertainties and their implications for rational planning." 539 F. Supp. at 1273.

Here again, the District Court's demands on DOT's Environmental Assessment were excessive. The Department cited and commented upon the Sandia Report's estimate of the extent of a high-consequence accident.

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The Sandia Report's estimate was toward the high end of the scale of predictions offered to the Department.¹⁸ For a freakish accident that is only theoretically possible, the Department did not commit reversible error by conservatively accepting an estimate of serious impact without noting and attempting to analyze professional disagreement over the precision of the estimate.

Social Consequences. The District Court also faulted DOT's Environmental Assessment for its failure to consider the psychological impact that HM-164 would have on the general public, even in the absence of any serious accidents. Since the District Court wrote its opinion, the Supreme Court has determined that fear is not a cognizable environmental impact under NEPA. See *Metropolitan Edison Co. v. People Against Nuclear Energy*, 103 S. Ct. 1556 (1983).

C. Overall Impact

At the heart of the District Court's criticisms of the Environmental Assessment lay its dissatisfaction with DOT's use of the results of the assessment of overall risk. In Judge Sofaer's view,

DOT's use of overall risk obfuscated the central question as to the environmental significance of its proposed action: whether a proposal entailing a credible risk of catastrophe demands treatment as one

¹⁸ Other commentators predicted that sabotage could exact a higher toll in human life than the Sandia Report estimated, see 539 F. Supp. at 1272, but the Sandia Report was generally more conservative than other studies. For instance, the NRC itself estimated that a "worst case" accident would cause 174 latent cancer fatalities with \$800 million of economic damage, whereas the Sandia Report estimated that latent cancer fatalities could run as high as 1800 and economic damages as much as \$9 billion. Compare NUREG-0170, *supra*, at 5-38 to -53, with Sandia Report, *supra*, at 66.

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"significantly affecting the quality of the human environment."

593 F. Supp. at 1274 (quoting 42 U.S.C. § 4332(2)(C)).

This final criticism can be understood in two ways, neither of which justifies declaring the Department's action arbitrary or capricious. First, Judge Sofaer could have meant that DOT was required to use some other form of risk assessment than overall risk analysis. Certainly, other risk techniques were available, and Judge Sofaer apparently preferred the so-called "mini-max" methodology employed by the Sandia Report.¹⁹ *Id.* at 1275. However, in reviewing an environmental assessment, a district court is precluded from imposing its own choice of risk analysis upon a federal agency. As long as the agency's choice of methodology is justifiable in light of current scientific thought, a reviewing court must accept that choice. In this case, DOT had discretion to apply overall risk analysis in its Environmental Assessment.

Alternatively, Judge Sofaer might have meant that DOT was wrong to conclude that HM-164 would have no significant impact on the environment once the Department had conceded the infinitesimal probability that the Rule might lead to catastrophic consequences. We believe, especially in light of the Supreme Court's recent caution in *Baltimore Gas, supra*, that this view does not comport with the degree of deference that courts should accord to agency determinations concerning environmental consequences. In *Kleppe v. Sierra Club, supra*, 427 U.S. at 410 n.21, the Supreme Court stated that neither NEPA nor its

¹⁹ Under "mini-max" analysis, the Sandia Report simply analyzed the worst possible consequences of a highway accident without considering the likelihood of that event.

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legislative history "contemplates that a court should substitute its judgment for that of the agency as to the environmental consequences of its actions. . . . The only role for a court is to insure that that agency has taken a 'hard look' at environmental consequences." Here, DOT considered a rule that might be expected to generate a catastrophic accident approximately once every 300 million years. After receiving advice from all sides, the Department decided that such a remote possibility, even of a serious consequence, did not create a "significant" risk for the human environment. Disquieting as it may be even to contemplate such matters, this decision cannot be said to be an abuse of discretion.²⁰

V.

Throughout its opinion, the District Court emphasized the effect of HM-164 on New York City. To a large extent the proceedings in the District Court can be viewed not as a review of the validity of HM-164 as applied to New York City but as an inquiry into DOT's anticipated denial

²⁰ Our dissenting colleague appears to take the view that the very existence of the "worst case" possibility would be sufficient to require preparation of an EIS, regardless of the infinitesimal probability that the "worst case" accident will happen. We do not doubt the general proposition that "worst cases" do occur. Planes crash, and the Titanic sank. What we reject is an automatic rule requiring preparation of an EIS for every action that has any possibility, however remote, of causing serious accidental injury. Such a rule would routinely require an EIS for federal actions, since it is hard to imagine any agency action involving people or equipment that is not subject to some estimatable risk of causing serious accidental injury. In this case, reasonable minds may differ as to whether or not the gravity of the "worst case" accident or other less serious accidents, discounted by their improbability, presents an overall risk of sufficient significance to warrant an EIS. So long as that choice falls within the range of reasonable dispute, an agency's informed decision not to require an EIS is neither arbitrary nor capricious.

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of the City's request for a non-preemption ruling under section 112(b) of HMTA. To the extent that this occurred, it was premature. In framing HMTA, Congress decided that federal regulations would presumptively preempt inconsistent local regulations and that the local authorities would then have the burden of demonstrating to DOT that their local regulations provided greater safety without burdening interstate commerce. Courts are not free to reverse this presumption or to shift the burden of proof from state to federal authorities.

If DOT ultimately denies New York City's pending application for a non-preemption ruling, the City can seek judicial review of that denial. At that time, a federal court will review the Department's action, if adverse, with the benefit of both the Department's explanation for its denial and a fully developed record comparing New York City's Health Code to HM-164 as applied to New York City. If the Court determines that the Department impermissibly denied the City's application for non-preemption, adequate relief will then be available.²¹ In the interim, however, Congress has legislated that the federal rule will govern.

The judgment of the District Court is reversed, and the case is remanded with instructions to enter a judgment upholding HM-164.

²¹ The parties differ over whether New York City would be entitled to a non-preemption ruling if it can show that its local regulations enhance safety without burdening interstate commerce or whether DOT retains discretion to deny a non-preemption ruling even if the City makes such a showing. This question is not before us, and we do not reach it.

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OAKES, *Circuit Judge* (dissenting):

The question I find crucial in this case is whether the district court erred in holding that DOT could not properly conclude on the record before it that the implementation of HM-164 would not "significantly" affect the environment and that an environmental impact statement (EIS) was therefore unnecessary. When we talk of "worst-case" accidents, which one of the two major studies the DOT relied on, the Sandia Report, indicated could result in 1,800 latent cancer fatalities, 290 early morbidities, and 5 early fatalities, not to mention genetic effects—in the case of plutonium transport—or \$9 billion in "Direct Economic Impact"—in the case of PO-0210 transport—it seems almost nonsense to talk of no "significant" impact. "Worst-case" accidents have a way of occurring—from Texas City to the Hyatt Regency at Kansas City, from the Tacoma Bridge to the Greenwich, Connecticut, I-95 bridge, from the Beverly Hills in Southgate, Kentucky, to the Cocoanut Grove in Boston, Massachusetts, and from the Titanic to the DC-10 at Chicago to the I-95 toll-booth crash and fire—and that alone would end the case for many. As I said in respect to nuclear accidents in New York City in *Morningside Renewal Council, Inc. v. United States Atomic Energy Commission*, 482 F.2d 234, 241-42 (2d Cir. 1973) (Oakes, dissenting), *cert. denied*, 417 U.S. 951 (1974), it is the *potential* environmental effect that is important. In my opinion, the effect of the "worst-case" accident alone would be sufficiently substantial to justify an EIS, since the effect of HM-164 is to permit the transportation of nuclear waste and other materials through the most densely populated city in the United States, when "credible" accidents may occur. But the worst-case accident is only one shade of a spectrum of potentially significant environment impact; as the severity

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of the accident lessens, and the possibility of its occurrence increases, the potential impact remains serious enough in my view to require an EIS, but I will refer only to this one end of the spectrum, for illustrative purposes.

The DOT concluded that the possibility of an accident involving the release of dangerous radioactive materials is exceedingly low. Specifically, a highest severity (Class VIII) accident, for example, has "a probability nationwide of 1.1×10^{-5} ," HM-164 at 13, citing Sandia Report, while the probability of such an accident is "estimated to be no greater than the 3×10^{-9} per year for 1975 shipping rates" by the Nureg-0170 Report. Both of these figures—the latter suggesting that a "worst-case" accident could occur only once in 300 million years—are based on 1975 shipments, where presumably there was no worst-case accident. The Nureg-0170 Report attempts to place these figures in perspective by comparing them to "many commonly accepted accident risks" as follows:

COST IN DAYS OF LIFE ASSOCIATED WITH VARIOUS ACTIVITIES (Ref. 3-19)

<i>Activity</i>	<i>Cost in Days of Life</i>
Living in city (rather than in country)....	1800
Remaining unmarried.....	1800
Smoking 1 pack of cigarettes per day....	3000
Being 4.5 kg overweight.....	500
Using automobiles	240
170 mrem/year of radiation dose.....	10
Transportation of radioactive material* ..	0.030

*Calculation based on an average of 0.5 mrem per year to an *average* exposed individual (see Chapter 4).

Nureg-0170, at 3-13 (emphasis added).

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INDIVIDUAL RISK OF EARLY FATALITY
BY VARIOUS CAUSES (Ref. 5-10)

<i>Accident Type</i>	<i>Number per Year</i>	<i>Individual Risk per Year</i>
Motor Vehicle	5.5×10^4	1 in 4,000
Falls	1.8×10^4	1 in 10,000
Fires	7.5×10^3	1 in 25,000
Drowning	6.2×10^3	1 in 30,000
Air Travel	1.8×10^3	1 in 100,000
Falling Objects	1.3×10^3	1 in 160,000
Electrocution	1.1×10^3	1 in 160,000
Lightning	160	1 in 2,000,000
Tornadoes	91	1 in 2,500,000
Hurricanes	93	1 in 2,500,000
100 Nuclear Reactors	3×10^{-3} *	1 in 5,000,000,000
Transportation of Radioactive Material (from Radioactive causes)	3.5×10^{-4} ** ...	1 in 200,000,000,000***

* Statistical estimate.

** Statistical estimate for 1975.

*** Using a population at risk of 75 million people.

I find quantifications such as these absurd on their face. The tables above compare the risks of known and fairly common accidents and activities with nuclear related activities for which there is little and limited historical data. Extrapolation on the basis of limited time-place experience is notoriously misleading; I note that the above tables were compiled before the near-catastrophic occurrence at Three Mile Island with its sordid tale of human and mechanical error.

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I am aware that courts have neither the expertise nor the right to second-guess risk assessment methodologies employed by agencies, *see Baltimore Gas & Electric Co. v. Natural Resources Defense Council, Inc.*, 51 U.S.L.W. 4678, 4682 (U.S. June 6, 1983), and that an EIS need not address remote and highly speculative consequences of proposed action. *See, e.g., South Louisiana Environmental Council, Inc. v. Sand*, 629 F.2d 1005, 1016 (5th Cir. 1980); *Concerned About Trident v. Rumsfeld*, 555 F.2d 817, 828-29 (D.C. Cir. 1977). But DOT has adopted and is therefore bound by Council on Environmental Quality guidelines enacted for the purpose of implementing NEPA. Those regulations make it clear that, in determining whether a proposed action is likely to affect the environment "significantly," decisionmakers must consider, among other things, "[t]he degree to which the effects on the quality of the human environment are likely to be highly controversial" and "[t]he degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks." 40 C.F.R. § 1508.27(b)(4), (5). To be sure, the fact that people are highly agitated and willing to go to court does not alone render a given project "controversial," *see Fund for Animals v. Frizzell*, 530 F.2d 982, 988 n.15 (D.C. Cir. 1975); instead, a project is controversial if "a substantial dispute exists as to the size, nature, or effect of the major federal action." *Foundation for North American Wild Sheep v. United States Department of Agriculture*, 681 F.2d 1172, 1182 (9th Cir. 1982) (emphasis in original) (quoting *Rucker v. Willis*, 484 F.2d 158, 162 (4th Cir. 1973). But the purpose of NEPA generally and the EIS requirement in particular is to ensure that the decision-making process canvasses "every significant aspect of the environmental impact of a proposed action." *Vermont*

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Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc., 435 U.S. 519 (1978). In this case, as in *Baltimore Gas & Electric Co.*, *supra*, policymakers must make hard choices "in the face of uncertainties about the long-term effects on the environment." 51 U.S.L.W. at 4680. Given the "unique [and] unknown risks" associated with and the "highly controversial" nature of nuclear waste transport, I believe that the DOT's decision not to prepare an EIS was arbitrary, capricious, and not in accordance with law, viz., the CEQ guidelines cited above.

Even if I am wrong with respect to the DOT's obligation under CEQ guidelines, however, I believe that HM-164 is itself defective because it relies on insufficient or contradictory data at several crucial points and because it fails to address certain risks—the effect of human error and the possibility of sabotage, for example—that bear directly on the possibility of a serious consequence, "worst-case" accident. My conclusion in this regard is based primarily on the following factors which, because they were all addressed by Judge Sofaer in his opinion, I will only summarize here.

1. *Shipment volume analysis*

The estimates concerning the number of shipments are subject to variations—wholly unresolved by the DOT's environmental assessment—of several orders of magnitude. The assessment states that

A 1985 shipment model is not contained in the urban studies, but for spent fuel the NUREG 0170 figures are projected from 254 packages shipped by truck per year in 1975 to 1,530 in 1985, a 600% increase. The IRG Report estimates 260 truck ship-

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ments of spent fuel in 1985. If the increase used in NUREG 0170 were applied to figures for the number of spent fuel packages and the total number of radioactive materials packages used in the Urban Environs Draft, one would project that 72 truck shipments of spent fuel would occur in New York City in 1985, out of [a] total of 3.95×10^3 packages shipped. (Total packages shipped other than spent fuel are projected in NUREG 0170 for 1985 by applying a factor of 2.6, or a 10% increase per year, to the 1975 figures. NUREG 0170, p. A-20; 1978 Urban Environs Draft, p. 61.) The more conservative IRG Réport estimate would leave the spent fuel shipments in 1985 in New York City unchanged from 1975.

HM-164 at 19. As Judge Sofaer pointed out,

DOT failed to mention data on spent fuel and plutonium shipments collected in a report prepared for the NRC in 1978, and published by that agency in 1980. That report refers to estimates made by the Environmental Protection Agency (EPA) in a 1974 report on both spent fuel and plutonium shipments with projections through the year 2020. The number of spent fuel shipments (both truck and rail) are estimated to increase to 2,103 by 1985, to 7,513 by 1000, and to 15,043 by 2020. Plutonium shipments (50% by truck) are estimated to increase from 60 in 1975, to 400 by 1985, 4764 by 2000, and 20,737 by 2020. NUREG/CR-0742: *Review and Integration of Existing Literature Concerning Potential Social Impacts of Transportation of Radioactive Materials in Urban Areas 71* (Exhibit II-4). The authors wrote:

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Although the average number of miles per shipment are presumed to decrease as new facilities are built around the country, the number of shipments per year is estimated to increase so rapidly that total units-times-miles figures increase over the 45 year period by a factor of 18 for spent fuel and 138 for plutonium. Consideration of the number-of-shipments columns might well give one pause, since each shipment provides an opportunity for an accident or a diversion, in addition to possible public response to "normal" transport. The estimated increase from 363 spent fuel shipments in 1975 to over 2,000 by 1985 might be enough cause for concern, but the estimated increase from 60 plutonium shipments to 400 in the same period is potentially much more serious.

Id. at 70. Of course, these data might be unreliable, but DOT did not analyze the question.

539 F. Supp. at 1267 n.9. In my view an agency is no more justified in "neglect[ing] to mention a serious environmental consequence . . . or otherwise swe[eping] 'stubborn problems or serious criticism . . . under the rug,' " *County of Suffolk v. Secretary of Interior*, 562 F.2d 1368, 1384-85 (2d Cir. 1972), *cert. denied*, 412 U.S. 908 (1973) (quoting *Silva v. Lynn*, 482 F.2d 1282, 1285 (1st Cir. 1973)), in deciding whether to prepare an EIS than it is in preparing an EIS. The failure to resolve the shipment volume question, given its obvious importance in calculating accident risk, strikes me as a serious deficiency in the DOT's decisionmaking process.

*Appendix A**2. Accidents data*

The volume of shipments is but one component of the accident risk estimates relied on in HM-164. The other essential component is accident frequency, i.e., fractional number of accidents per vehicle-kilometer, and I agree with Judge Sofaer's conclusion that the accident data relied on in HM-164 are wholly inadequate. The Nureg 0170 Report's truck accident frequency assumption was apparently lifted from a 1974 symposium paper; the Report merely cites this source without discussing either the derivation or reliability of the estimate it contains. The Sandia Report's estimate of truck accident frequency apparently relies, at least in part, upon the DOT's own Hazardous Materials Incident Reporting System, a data base that, as Judge Sofaer noted, the DOT itself has conceded is unreliable because

the DOT does not know the exact number of companies subject to this requirement [of reporting accidents;] agency officials concede that those reporting constitute only a small percentage of them. Furthermore, the DOT concedes that the information transmitted by these reports is not reliable. The DOT Hazardous Materials Transportation Task Force noted that "the adequacy and relevancy of much of the data [in the incident reports] are questionable" and "the credibility of available incident data is questionable, and there is no routine validation of the data [by the DOT]."

539 F. Supp. at 1268, National Transportation Safety Board, Safety Effectiveness Evaluation 5, citing DOT Task Force Report. HM-164 itself never explicitly addresses this issue, but instead merely observes that "the low historical accident rates do tend to support the

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research conclusions that the risks in transporting radioactive material by highway are very low." HM-164 at 33. That only accidents that are not particularly serious have been reported over the very limited time that the DOT has passively received accident reports submitted from time to time by carriers does not to my mind support the prediction that a serious accident is so unlikely to occur that the preparation of an EIS is unnecessary.

3. Packaging response data

The volume of shipments and the accident frequency rate are the primary components of accident risk; the consequences of an accident, however, turn on the integrity of the package containing the radioactive material. The district court found, and I agree, that HM-164's treatment of the uncertainty surrounding packaging response data was insufficient. Again, the very sources relied on by the DOT in HM-164 point up the limitations of the data those sources employed. As Judge Sofaer noted, 539 F. Supp. at 1268 n.11, "NUREG-0170 recognizes [at 5-20] that the 'paucity of data on package responses to severe accidents' makes the consequences of such accidents difficult to predict. Accidents became increasingly catastrophic as greater quantities of radioactive materials are released from their containers." Moreover, HM-164 does not even comment upon the Sandia Report's statement at 49 that places some of NUREG-0170's conclusions about severe accidents in doubt:

Before summarizing the results of the analysis, a few comments on data changes since the working draft of this report (Reference 10) was published are in order. The major change has been in the consideration of

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material which can be released from a spent fuel shipping cask. In the previous analysis, a fraction of the entire cask contents was assumed to be released and aerosolized. After consideration of test data on cask response to severe accidents, the authors decided that this assumption was not reasonable. The analysis of cask accidents in the present study is based upon the more realistic assumption that the major source of radioactive material which would be released in a severe accident is the material deposited on the cask interior and exterior surfaces of the fuel elements during their lifespan in the reactor (known as reactor "crud" and containing predominantly primary system corrosion products). . . . [A]bout 154 curies of Co-60 are present on the surface of the fuel pins. Recent information indicates that approximately 20% of the adhered crud could be easily removed by physical shock.

Given the uncertainties surrounding packaging response—the record indicates that much of the data was derived from computer simulation rather than actual testing—the DOT should have addressed the issue more thoroughly.

4. Human error

In this respect I agree with the district court that human error was not sufficiently factored into DOT's probability estimates. The majority refers to "the extremely low probability that any cask involved in a truck accident would also be compromised by human error," majority op. at 35-36, but I note that the Sandia Report bases its analysis on *one* study referring to 3,939 cask shipments (rail and truck) as to which 16 incidents were "traced

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directly to a human error or deviation from [quality assurance] practices," *id.* at 77, something quite different from the human error entering into transportation accidents themselves. As the report itself concludes:

As mentioned earlier, human errors resulting in accidents *are not included in this analysis*. Although there are possible synergisms that would connect the human error with a vehicular accident, the two were considered separable for this treatment. The results should be interpreted carefully since the source of the initial data for the determination of incident rates *were vastly different*.

Sandia Report at 84 (emphasis added). Thus I cannot agree with the majority, *supra* at 36, that "since the effect of human error is inevitably included in the historic rate of accidents, the Department, at least implicitly, considered human error in its probability assessment." I think it did nothing of the sort, and I do not believe that statistical apologetics in the name of judicial deference to agency expertise is sound as a matter of law or policy.

5. Sabotage

I believe that, under *Natural Resources Defense Council, Inc. v. Nuclear Regulatory Commission*, 539 F.2d 824, 842 (2d Cir. 1976), *vacated and remanded on other grounds*, 434 U.S. 1030 (1978), the DOT's failure to address the special problems of theft, diversion or sabotage of hazardous nuclear materials is fatal to its conclusion of "no significant environmental effect." Even though these problems may be "unquantifiable," Sandia Report at 85, they were thought sufficiently serious to justify fifty-five pages of analysis therein, analysis limited, however, so as "[t]o avoid providing potential adver-

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saries with a 'cookbook' of methods." *Id.* at 86. The fact that there has been a "world-wide increase in terrorist activity," *id.* at 85, that "[h]igh explosives are available commercially in a variety of chemical and physical forms," *id.* at 86, and that "[a]ccess to shipments of spent fuel would be possible for an adversary intent upon sabotage or theft," *id.* at 91, would seem to make the subject a matter for serious consideration, at least in an Environmental Impact Statement.

I repeat that I fully realize that agencies have to be shown extreme deference in their environmental determinations, particularly when they are "making predictions, within [their] area of special expertise, at the frontiers of science." *Baltimore Gas & Electric Co.*, 51 U.S.L.W. at 4682. But for the reasons set out above I believe that DOT's determination that there is or will be no significant effect upon the environment from a national rule pertaining to the highway routing of radioactive materials was arbitrary and capricious. When we add to that the fact that DOT did not even consider alternative modes of transport or local storage in arriving at its rule, we have a result which effectively negates NEPA and runs contrary to the spirit of cases decided in this court. See, e.g., *WATCH (Waterbury Action to Conserve Our Heritage, Inc.) v. Harris*, 603 F.2d 310, 326-27 (2d Cir.), cert. denied, 444 U.S. 995 (1979); *Trinity Episcopal School Corp. v. Romney*, 523 F.2d 88, 92-93 (2d Cir. 1975); *Hanly v. Kleindienst*, 471 F.2d 823 (2d Cir. 1972), cert. denied, 412 U.S. 908 (1973).

I therefore respectfully dissent.

APPENDIX B

May 5, 1982 District Court Judgment

UNITED STATES DISTRICT COURT

Southern District of New York

THE CITY OF NEW YORK,

Plaintiff,

and

**THE STATE OF NEW YORK, THE TOWN OF
BROOKHAVEN, and SULLIVAN COUNTY,**

Plaintiffs-Intervenors,

—against

**THE UNITED STATES DEPARTMENT OF TRANS-
PORTATION and THE MATERIALS TRANSPORTA-
TION BUREAU OF THE UNITED STATES DE-
PARTMENT OF TRANSPORTATION,**

Defendants,

—and—

**COMMONWEALTH EDISON COMPANY, CONSOLI-
DATED EDISON COMPANY OF NEW YORK, INC.,
GEORGIA POWER COMPANY, LONG ISLAND
LIGHTING COMPANY, NORTHEAST UTILITIES,
NORTHERN STATES POWER COMPANY, PACIFIC
GAS AND ELECTRIC COMPANY, POWER AUTHOR-
ITY OF THE STATE OF NEW YORK, PUBLIC**

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SERVICE ELECTRIC AND GAS COMPANY, SOUTH-
ERN CALIFORNIA EDISON COMPANY, and YAN-
KEE ATOMIC ELECTRIC COMPANY,

Defendants-Intervenors.

JUDGMENT

81 Civ. 1778 (ADS)

Upon the cross-motions for summary judgment, and upon the Court's Amended Opinion dated May 5, 1982, it is

ORDERED, ADJUDGED, AND DECREED, that the motions by plaintiff and plaintiff-intervenors for summary judgment are granted to the extent set forth in this Judgment but are otherwise denied; and it is further

ORDERED, ADJUDGED, AND DECREED, that the regulations promulgated by defendants, United States Department of Transportation and its Materials Transportation Bureau, on the highway routing of radioactive materials, 46 Federal Register 5298-5318 (January 19, 1981), including but not limited to 49 CFR §177.825 and Appendix A to Part 177, are declared to be arbitrary, capricious, an abuse of discretion, and in violation of both the National Environmental Policy Act, 42 U.S.C. §4321 *et seq.*, and regulations promulgated pursuant thereto ("NEPA"), and the Hazardous Materials Transportation Act ("HMTA"), 49 U.S.C. §1801 *et seq.*, to the extent that said regulations would override or preempt State or local bans on truck, highway, or road transportation

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of spent (irradiated) nuclear fuel and other large quantity shipments of radioactive materials, as defined at 49 CFR §173.389(b), through the City of New York and other densely populated areas without undertaking and making reviewable findings concerning the risks posed and the potential consequences of incidents involving the transport of such materials through such areas; without complying with the mandate of the HMTA to avoid where reasonably possible all significant risks not inherent in the transport of such materials; and without examination of the availability of nonhighway modes of transport and other appropriate alternatives; and it is further

ORDERED, ADJUDGED, AND DECREED, that until compliance with NEPA and HMTA the defendants are hereby permanently enjoined from enforcing, implementing, administering, or in any way relying upon the regulations published at 46 Fed. Reg. 5298-5318 (January 19, 1981) and 49 CFR §177.825 and Appendix A to part 177, in such a manner as to override or preempt New York City's ban on truck, highway, or road transportation of spent (irradiated) fuel and other large quantity shipments of radioactive materials; and it is further

ORDERED, ADJUDGED, AND DECREED, that until compliance with NEPA and HMTA the defendants are hereby permanently enjoined from enforcing, implementing, administering, or in any way relying upon the regulations published at 46 Fed. Reg. 5298-5318 (January 19, 1981) and 49 CFR §177.825 and Appendix A to part 177, in such a manner as to override or preempt existing or future state or local bans on truck, highway, or road transportation of spent (irradiated) fuel and other large quantity shipments of radioactive materials through densely

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populated areas, once the state or local jurisdiction, on application to DOT, shows (1) that overriding its ban would result in road transport of such materials through areas in the range of population densities for which DOT's analysis of high consequence accidents is inadequate and (2) that an alternative to road transport exists that, from the evidence available, appears to be feasible and potentially safer than road transport.

Dated: New York, New York

May 5, 1982

s/ CHARLES L. BRIANT

U.S.D.J.

Signed at the request of
Abraham D. Sofaer, United States
District Judge, in his absence, in
my capacity as Part I Judge. See
Rule 5(2) of the Rules for Division
of Business S.D.N.Y.

Judgment Entered 5/6/82

s/ RAYMOND F. BURGHARDT
Clerk

APPENDIX C

May 5, 1983 District Court Opinion

UNITED STATES DISTRICT COURT

Southern District of New York

81 Civ. 1778 (ADS)

THE CITY OF NEW YORK,

Plaintiff,

and

**THE STATE OF NEW YORK, THE TOWN OF
BROOKHAVEN, and SULLIVAN COUNTY,**

Plaintiffs-Intervenors,

—against—

**THE UNITED STATES DEPARTMENT OF TRANS-
PORTATION and THE MATERIALS TRANSPORTA-
TION BUREAU OF THE UNITED STATES DE-
PARTMENT OF TRANSPORTATION,**

Defendants,

—and—

**COMMONWEALTH EDISON COMPANY, CONSOLI-
DATED EDISON COMPANY OF NEW YORK, INC.,
GEORGIA POWER COMPANY, LONG ISLAND
LIGHTING COMPANY, NORTHEAST UTILITIES,
NORTHERN STATES POWER COMPANY, PACIFIC
GAS AND ELETRIC COMPANY, POWER AUTHOR-**

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ITY OF THE STATE OF NEW YORK, PUBLIC
SERVICE ELECTRIC AND GAS COMPANY, SOUTH-
ERN CALIFORNIA EDISON COMPANY, and YAN-
KEE ATOMIC ELECTRIC COMPANY,

Defendants-Intervenors.

[Appearances Omitted in Printing]

OPINION

Sofaer, District Judge:

On January 19, 1981, the United States Department of Transportation ("DOT") published a "Final Rule" concerning the transportation of radioactive materials pursuant to its authority under the Hazardous Materials Transportation Act ("HMTA"), 49 U.S.C. §§ 1801-1812 (1976). The rule, scheduled to take effect on February 1, 1982, would permit the shipment by road throughout the nation of all types of radioactive materials. One avowed purpose of the rule was to override local prohibitions against the shipment of radioactive materials, particularly a local regulation adopted by the Board of Health of New York City ("City") on January 15, 1976. The City commenced this action on March 25, 1981, seeking to invalidate DOT's rule or, at least, to prevent it from overriding the City's regulation. The State of New York intervened as a plaintiff, moving for discovery and a preliminary injunction against enforcement of DOT's rule within the State's borders; the Town of Brookhaven and Sullivan County, New York, joined the City's and State's

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efforts. The United States has been joined in its defense of DOT's rule by numerous intervening power companies as well as by several amici curiae.

Plaintiffs seek relief on numerous grounds. Several are meritless. Indeed, the welter of arguments contained in plaintiffs' papers tends to obscure the fact the DOT's actions are challenged meaningfully only insofar as they relate to the highway transportation of spent fuel from nuclear reactors and other large-quantity shipments of radioactive materials through densely populated areas such as New York City. In all other respects, the administrative record and the law supports DOT's Final Rule.

Insofar as DOT's actions require states and localities to permit the highway transport of spent fuel and other large-quantity shipments through densely populated areas, the record developed by DOT cannot justify the challenged rule. The agency has failed to fulfill its responsibilities under the National Environmental Policy Act ("NEPA"), 42 U.S.C. §§ 4321-4347 (1976), and under the regulations promulgated under NEPA by the Council on Environmental Quality and by DOT itself. In particular, DOT has failed adequately to evaluate and to address itself to the problems posed by low-probability/high-consequence occurrences that are concededly "credible." NEPA requires that an agency confronted with these problems, fundamental in a society dependent on inherently dangerous technologies, conduct a thorough examination and make determinations that are susceptible to review concerning: (1) the probability of the occurrence contemplated; (2) the potential consequences of such an occurrence; and (3) the environmental risk reflected by the probability and the consequences estimated. Be-

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cause its environmental evaluation is deficient in all three respects, DOT's Environmental Assessment is inadequate, and DOT's finding that its action will have no significant environmental impact—and therefore that no environmental impact statement need be prepared—is insufficiently supported by the present record. Furthermore, DOT has failed adequately to consider alternatives to highway transport that might reduce or eliminate the risks posed to urban areas by low-probability/high-consequence accidents or by malevolent acts. Even if DOT could lawfully choose to regulate only highway transport at this time, it cannot rationally evaluate the option of taking no action without examining at least superficially the availability of non-highway modes to accommodate shipments prevented by local and state laws from crossing densely populated areas. DOT has therefore failed to perform its obligation to “study, develop, and describe” appropriate alternatives.

Apart from DOT's obligation under NEPA to evaluate more fully the environmental consequences of its proposed rule, HMTA imposes similar duties on DOT and in addition sets limits on the agency's authority to deem certain risks acceptable. For the same reasons DOT's analysis is invalid under NEPA, its adoption of the challenged rule was an arbitrary and capricious exercise of its rulemaking authority under HMTA: DOT inadequately considered the risks of highway transport and the need, given potential alternatives, to impose those risks on the public. Further, DOT erroneously concluded that it is free under HMTA to subject unwilling states and localities to risks of potential catastrophe that DOT itself deemed “credible” and “important” when those risks are avoidable. HMTA mandates that in exercising its regu-

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latory power DOT avoid where reasonably possible all significant risk not inherent in the transportation of hazardous substances. In adopting a new rule covering the transportation of spent fuel and other large-quantity radioactive materials, DOT must be guided by Congress' policies, not by its own perception of acceptable risk. On the present record, DOT's regulation is unreasonable in light of the properly applicable legal standards.

The Court's role in this case is to conduct a "searching and careful" review of DOT's actions, but only in order to determine whether the agency has acted reasonably in fulfilling its statutory obligations. *Citizens to Preserve Overton Park, Inc., v. Volpe*, 401 U.S. 402, 416, 91 S.Ct. 814, 823, 28 L.Ed.2d 136 (1971). The nature of contemporary scientific disputes requires a court to give close attention to detail, to ensure that it neither fails to perform its duty to careful review, nor goes beyond its limited role because of any failure to give proper weight to all the evidence supporting the agency's judgment. A full review of the record is therefore necessary to identify all the evidence actually considered or implicitly supporting DOT's conclusion. After that review the opinion examines plaintiffs' numerous contentions.

I. Factual Background for DOT's Action

One of the problems created by the use of radioactive materials in American medicine and industry is the need to transport them. Our society is highly dependent on radioactive materials. In medicine, gamma-ray-emitting isotopes are commonly used to image specific areas and

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organs of the body. Radioisotopes of iodine are used to diagnose and treat thyroid disorders; other isotopes are used in millions of scanning procedures annually. Large quantities of Co-60 (cobalt) or Cs-137 (cesium) are used for cancer treatment, research, and large-scale food sterilization. Well-logging firms use radioisotopes to assess a well's capability; radioactive tracers are also used for this purpose. The radiography industry uses certain isotopes that emit high-energy gamma rays to examine the structural integrity of welded joints, particularly in large pipes and frames. Radioactive materials are especially effective in a large variety of gauging applications. And, of course, the nuclear power industry uses radioactive materials, and generates large quantities of irradiated (spent) fuel. All of these uses require transport to one degree or another, often at several different stages, including manufacture, use, and disposal.

As the use of radioactive materials has become increasingly common, public awareness of the dangers posed by their transportation has heightened. Since the middle of the 1970s, governmental authorities on federal, state, and local levels have begun to address the problem. In 1975 Congress passed HMTA to centralize authority in DOT to promulgate and enforce regulations to protect the public against "the risks to life and property which are inherent in the transportation of hazardous materials," including radioactive materials. 49 U.S.C. § 1801 (1976). The act specifically empowers the Secretary of Transportation to issue routing rules for the safe transportation of radioactive materials. *Id.* § 1804(a). Congress provided expressly for the preemption of state and local rules inconsistent with the act or with regulations adopted under it, except for inconsistent rules that DOT finds

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ensure equal or greater public safety than the inconsistent federal requirements and do not unreasonably burden interstate commerce. *Id.* § 1811.

DOT regulations that preexisted the passage of HMTA required motor vehicles containing hazardous materials to use routes that "do not go through or near heavily populated areas, places where crowds are assembled, tunnels, narrow streets, or alleys," unless "there is no practicable alternative." 49 C.F.R. § 397.9(a) (1980). Every vehicle containing hazardous materials was required to comply with local driving and parking laws, unless the local laws were at variance with a more stringent rule imposed by DOT; and state or local laws governing transport through vehicular tunnels used for mass transportation were specifically exempted from any arguable preemption. 49 C.F.R. §§ 177.810, 397.3 (1980). These regulations continued in effect after HMTA's adoption in 1975.

The Final Rule challenged in this proceeding is the direct result of DOT's determination to deal with the disruptive effects of a health regulation, adopted on January 15, 1976, by New York City's Board of Health as an amendment to its Health Code, prohibiting the commercial transport into or through the City of large-quantity or high-level radioactive materials. N.Y.C. Health Code § 175.111(l). Complaint of New York City, Ex. A.¹ The

¹ The amendment reads as follows:

(1) Notwithstanding the foregoing provisions of this section, a Certificate of Emergency Transport issued by the Commissioner or his designated representative shall be re-

(Footnote continued on following page)

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amendment effectively prevented the Brookhaven National Laboratories ("BNL") from shipping spent nuclear fuel

(Footnote continued from preceding page)

quired for each shipment, to be transported through the City or brought into the City, of any of the following materials:

(1) Plutonium isotopes in any quantity and form exceeding two grams or 20 curies, whichever is less;

(2) Uranium enriched in the isotope U-236 exceeding 25 atomic per cent of the total uranium content in quantities where the U-235 content exceeds one kilogram;

(3) Any of the actinides (i.e., elements with atomic number 89 or greater) the activity of which exceeds 20 curies;

(4) Spent reactor elements or mixed fission products associated with such spent fuel elements the activity of which exceeds 20 curies; or

(5) Any quantity of radioactive material specified as a "Large Quantity" by the Nuclear Regulatory Commission in 10 CFR Part 71, entitled "packaging of Radioactive Material for Transport."

A "note" appended to the resolution adopting this subsection explains:

It is intended that such Certificate will be issued for the most compelling reasons involving urgent public policy or national security interests transcending public health and safety concerns and that economic consideration alone will not be acceptable as justification for the issuance of such Certificate.

The resolution further amended § 175.111 to state that the section does not apply "to radiation sources shipped by or for the United States Government for military or national security purposes or which are related to national defense." Complaint of New York City, Exhibit A.

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from Long Island through densely populated areas of the City by truck. In addition the regulation would prevent shipments of spent fuel and other materials from traveling through the City from the Shoreham Nuclear Unit, expected to begin operating in 1983. On the very day that the City adopted the regulation, the federal government sued to have it declared preempted and unenforceable. Judge Inzer B. Wyatt denied preliminary relief on January 30, 1976, and the case was subsequently transferred to the suspense docket by stipulation. *United States v. City of New York*, 76 Civ. 273 (IBW). On March 1, 1977, Associated Universities, Inc., consisting of nine institutions whose representatives formed the BNL Board of Directors, sought a declaration from DOT that the City's regulation was inconsistent with HMTA and with DOT regulations. DOT denied the request on April 20, 1978, ruling that the City regulation was in effect a routing requirement and that, although DOT had the power to preempt local routing rules, the agency had not yet exercised that power. DOT recognized that the City had adopted its regulation because its public health officials had considered that, given the City's dense population, "the consequences of a major accident are too extreme to be tolerable, however remote the probability." 43 Fed.Reg. 16954, 16957 (1978). Even so DOT suggested that it disapproved of the City's regulation. *Id.* at 16957-58. Since 1976 BNL has shipped spent fuel by water, via New London, Connecticut, although that option may have been made unavailable by local law.²

² Defendant-intervenors informed the Court that, "[o]n August 21, 1978, New London enacted an ordinance banning the trans-

(Footnote continued on following page)

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On August 17, 1978, DOT invited comment "on the need, and possible methods for establishing routing requirements under the Hazardous Materials Transportation Act applicable to highway carriers of radioactive materials." 43 Fed.Reg. 36492 (1978). The "advance notice" made clear that it was motivated in particular by the fact that the City had prohibited highway transport of most commercial shipments of radioactive materials. It noted that other jurisdictions had adopted safety requirements imposing "significant additional responsibilities on shippers, carriers, or neighboring jurisdictions," all of which "affect interstate commerce." The notice proposed to examine the safety aspects of highway transport and the effects of existing regulations. Most significantly, DOT announced at that time that it intended to limit its consideration to *highway* routing, and would not consider alternative modes:

Only highway routing of radioactive materials will be considered in this docket. This does not rule out the possible future consideration of materials in other hazard classes and other modes of transportation. However, highway transportation, of all four modes of transportation, offers the largest number of routing possibilities and the greatest access to population centers.

(Footnote continued from preceding page)

port of [Brookhaven's] radioactive materials through its borders." Memo. of Law in Support of Motion for Summary Judgment by Defendant-Intervenors at 7. By letter dated January 18, 1982, plaintiff New York City has informed the Court that the New London ban was overridden by Connecticut Public Act No. 79-527 (June 18, 1979).

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Id. at 36492. The notice referred the public to several studies, including most notably the *Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes* ("NUREG-0170") prepared for the U. S. Nuclear Regulatory Commission ("NRC") in December 1977. It also noted DOT's intention to consider the results when available of NRC's study, then underway, of transport through urban areas, eventually published as *Transportation of Radionuclides in Urban Environs: Draft Environmental Assessment* (NUREG/CR-0743; SAND 79-0369) (1980) ("SANDIA"). Finally, the notice flatly asserted that, although its prior regulations left control of highway traffic of hazardous materials primarily to state and local regulation, those regulations reflected "the principle that such State and local regulation should not have the actual effect of altogether forbidding highway transportation between any two points, even where other modes of transportation are available." 43 Fed.Reg. at 36493. DOT did not explain how it derived this principle, although DOT had itself ruled that the City's regulation was consistent with federal law and with its own regulation, 49 C.F.R. § 397.9(a) (1980), requiring compliance wherever "practicable" with local rules that mandate avoidance of heavily populated areas. 43 Fed.Reg. at 16954.

DOT scheduled a public hearing on its notice. The Director of the City's Bureau of Radiation Control, Dr. Leonard R. Solon, submitted a statement proposing that DOT not limit itself to considering only highway transport. Dr. Solon suggested that barging spent fuel was feasible and that DOT should enlist the assistance of the Coast Guard and Department of Energy to develop plans for maritime transport. Solon Affidavit ¶ 11, New

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York City Notice of Cross-Motion for Summary Judgment [hereinafter "City Motion"] "This would minimize the public health risks of spent fuel transportation by bypassing populated areas." City Motion, Ex. B at 11. In addition, DOT's proposed rulemaking was specifically noted in the *Report to the President by the Interagency Review Group on Nuclear Waste Management* (March 1979) ("IRG Report"). Responding to the concerns of a highway-carrier representative regarding state and local restrictions, and of state and local officials regarding transportation through or near populated areas, the IRG Report stated that DOT's rulemaking was an important step towards resolution of the issues. Although comments received by the IRG said that there was a special need for DOT to resolve the *highway* routing question, *id.* at 113, the IRG, consistent with its comments on NEPA's requirement that alternatives be considered, *id.* at 21-22, articulated a broader view:

DOT should proceed expeditiously to examine the desirability of Federally prescribed routing requirements for *barge, rail, and highway* shipment of radioactive wastes, as well as the question of to what degree local restrictions are appropriate.

Id. at 112 (emphasis added).

A. DOT's Notice of Proposed Rulemaking

On January 31, 1980, DOT published its proposed rule for the highway routing of radioactive materials, as well as a draft environmental assessment. 45 Fed.Reg. 7140 (1980). The agency again reviewed the history of New

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York City's regulation and concluded that national action was necessary to prevent local and state rules from interfering with radioactive shipments by highway. The notice summarized accident data and, relying on NUREG-0170 and on the Sandia Laboratory's draft report *Transport of Radionuclides in Urban Environs: A Working Draft Assessment* (May 1978). DOT concluded that the "estimated risks" from both accident-free highway transport and accidents "are within the magnitudes of other socially accepted risks, such as evidenced in highway traffic fatality rates." The agency noted the public concern over highway transport of radioactive materials, but found it unjustified by the estimates:

Public concern with radioactive materials transportation, however, is more profound than those estimates would suggest is justified. In part this concern reflects the distinction between risks which are likely to be concentrated and similar risks spread over differing times and locations. The annual death rate from passenger car accidents, for example, usually is perceived as less catastrophic than major aircraft accidents, although far more people die in automobile accidents. This distinction may reflect the perceived limits of society to deal with catastrophic occurrences.

45 Fed.Reg. at 7141. In fact, the agency found, risks expected from highway transport of radioactive materials are minimal.

DOT took particular note of the possibility of a severe accident involving spent fuel or another type of large-quantity package. It found that "only large quantity

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packages pose even a remote risk of extraordinary or catastrophic accident consequences." *Id.* at 7148. It pointed out that such an accident was extremely unlikely, because the casks used for spent fuel shipments are massive (up to 35 tons) and able to sustain great impacts without rupture. Recognizing, however, the NUREG-0170 reported that a rupture could conceivably occur in extreme circumstances, the notice went on to describe the consequences of several "worst case" accidents. Some of these hypothetical accidents, DOT noted, could be extremely serious, but the most serious "is likely only once in 25 billions years and is thought by MTB not to warrant undue concern. A more typical high speed collision and fire in a highway accident is not likely to result in extensive radiological injuries or damage from the presence of either Type A, Type B or large quantity packages of radioactive materials." *Id.* at 7143.

The notice also recognized the possibility of sabotage. This risk, too, was limited to spent fuel and other large-quantity shipments. Although the possibility of such an attack exists, DOT suggested "the likelihood of a successful act of sabotage that breaches a spent fuel cask and disperses its contents may be quite small." *Id.* at 7150. Regulations established by the NRC for its licensees regarding shipments of spent fuel "will provide adequate physical protection" for licensees' shipments.

Finally, DOT maintained its resolve to refuse to consider alternative modes of transport. Despite the express suggestions of commentators that barging be considered where feasible, especially for spent fuel and other large-quantity shipments, the notice did not even mention barging. In a discussion of "Other Modes and Other Hazard-

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ous Materials," the agency only raised and deferred consideration of routing spent fuel by rail. *Id.* at 7151-52. The Draft Environmental Assessment, moreover, considered only alternatives involving highways. The only option even arguably covering nonhighway transport—to take no action—gave no attention to barging as a potential means of eliminating the burden on commerce that some local rules might otherwise impose. The Assessment specifically found that taking no action would have few if any effects. Nevertheless, DOT rejected the no-action option and proposed to implement its previously suggested policy by making it absolutely clear that, irrespective of alternatives, any state or local rule preventing the use of highways for any type of shipment between any two points was inconsistent with DOT's proposed rule:

State and local requirements which apply to any person because that person transports radioactive materials are inconsistent with this subchapter if they have any of the following effects.

(1) Completely prohibiting travel between any two points serviced by highway;

(2) Prohibiting the use of an Interstate highway, including prohibition of travel based on time of day, without designation of an equivalent preferred highway as a substitute in accordance with the provisions of this section

....

Id. at 7153 (proposed 49 C.F.R. § 177.825(d)).

The City responded to DOT's proposed rule on January 30, 1980. It took issue with DOT's analysis of dan-

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gers in transporting spent fuel and other large-quantity shipments through densely populated areas. In addition, the City renewed its criticism of DOT's refusal to consider the feasibility of transporting spent fuel by barge. It noted, in particular, that NUREG-0170, on which DOT placed great reliance for its findings and conclusions, had found barging a feasible alternative with respect to many reactor sites:

The fact that transportation costs are so much lower for barges than for other modes makes this alternative certainly worth additional investigation. Barge transportation of irradiated fuel may be a viable alternative, at least for some specific reactor sites, if not as a nationwide scheme.

NUREG-0170 at 6-11. The City contended, moreover, that barge transport was safer than highway transport of large-quantity shipments through its densely populated limits. Finally, arguing that its regulation afforded greater protection without burdening interstate commerce, the City requested that DOT issue a nonpreemption ruling with its final rule, so as to preclude the existence of a period in which spent fuel shipments by highway would be made through the City while its nonpreemption request was pending. Complaint of New York City, Ex. D.

DOT responded to the City's nonpreemption request on July 31, 1980. It included the City's comments in the record and agreed to consider them before taking final action. But it refused to docket the nonpreemption request, because no final rule had been promulgated with which the City's regulation could be deemed inconsistent. Douglas A. Crockett, then of DOT's Office of Chief Counsel, raised no other objection to the City's request at

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that time, and in fact suggested to then Corporation Counsel Allen G. Schwartz that "you may wish to renew your application at a more appropriate time." City Motion, Ex. M.

B. DOT's Final Rule, HM-164

DOT published its Final Rule on January 19, 1981, to take effect on February 1, 1982. 46 Fed.Reg. 5298 (1981). In most respects, the rule follows the scheme earlier proposed. In general, the rule classifies covered materials as Type A, Type B, or large-quantity radioactive materials, which, respectively, must be packaged for shipment in Type A, Type B, or specially approved Type B containers. "Large quantity radioactive materials" embraces spent nuclear reactor fuel. 49 C.F.R. § 173.389 (1980). The rule specifies what shipments must be "placarded," 49 C.F.R. §§ 172.403(d), 172.504 (1980), leaving unplacarded shipments unregulated, as posing no hazard. For placarded shipments, the rule requires carriers to use routes that "minimize radiological risk," but in general the rule does not mandate use of specified routes. For large quantity shipments, by contrast, HM-164 requires the use of "preferred routes" for highway transportation. In particular, HM-164 provides, in relevant part:

Unless otherwise permitted by this section, a carrier and any person who operates a motor vehicle containing a package of large quantity radioactive material as defined in § 173.389(b) of this subchapter shall ensure that the vehicle operates over preferred routes selected to reduce time in transit,

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except that an Interstate System bypass or beltway around a city shall be used when available.

(1) A preferred route consists of—

(i) An Interstate System highway for which an alternative route is not designated by a State routing agency as provided in this section, and

(ii) A State-designated route selected by a State routing agency (see § 171.8 of this subchapter) in accordance with the DOT "Guidelines for Selecting Preferred Highway Routes for Shipments of Large Quantity Radioactive Materials".

46 Fed.Reg. at 5316-17 (to be codified at 49 C.F.R. § 177.825(b)) [hereinafter cited only to C.F.R.]. The "Guidelines" require that, in selecting a preferred route, the State routing agency analyze radiation exposure, costs, economic risks from accidents, public health risks, emergency response capabilities, evacuation plans, traffic fatalities and injuries, and the locale of special facilities. City Motion, Ex. W.

The Final Rule deleted from the proposed official regulations the provision expressly declaring inconsistent all local bans on highway transport. Instead, DOT reiterated that position and policy at greater length in what was to become Appendix A to C.F.R. Part 177. 46 Fed. Reg. at 5317. State and local jurisdictions are informed how they "can exercise authority over motor carriers under [their] own laws in a manner that the Department of Transportation considers to be consistent with rules in Part 177." The Appendix states, in relevant part:

*Appendix C**III. Large quantity radioactive materials*

A. *State routing rules.* A State routing rule which applies to large quantity radioactive materials is inconsistent with Part 177 if—

1. It prohibits transportation of large quantity radioactive materials by highway between any two points without providing an alternate route for the duration of the prohibition; or

2. It does not meet all of the following criteria:

(a) The rule is established by a State routing agency as defined in § 171.8 of this subchapter;

(b) The rule is based on a comparative radiological risk assessment process at least as sensitive as that outlined in the "DOT Guidelines";

(c) The rule is based on evaluation of radiological risk wherever it may occur, and on a solicitation and substantive consideration of views from each affected jurisdiction, including local jurisdictions and other States; and

(d) The rule ensures reasonable continuity of routes between jurisdictions.

B. *Local routing rules.* A local routing rule that applies to large quantity radioactive materials is inconsistent with this Part if it prohibits or otherwise affects transportation on routes or at locations either—

1. Authorized by Part 177, or

2. Authorized by a State routing agency in a manner consistent with Part 177.

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Under this interpretive policy, § 175.111(l) of the New York City Health Code is inconsistent with the routing rules of 49 C.F.R. § 177.825(b) because it effectively prohibits use of the highways for shipments through New York City of large-quantity radioactive materials.

DOT persisted, in adopting the Final Rule, in refusing to evaluate alternative modes of transport. It resolved to consider "only routing requirements for radioactive materials shipped by highway, the focus of most State and local actions, rather than undertake a comprehensive regulatory proceeding to consider all classes of hazardous materials and all modes of transportation." 46 Fed.Reg. 5300 (1981). The Regulatory Evaluation and Environmental Assessment filed with the Final Rule also reflected this policy. It restricted its consideration of alternatives to taking no action (which it found would have little or no effect), and to taking a variety of other actions, all involving highways. Environmental Assessment, DOT Motion, Ex. D.

The ultimate basis for DOT's Final Rule is "that the public risks in transporting these materials by highway are too low to justify the unilateral imposition by local governments of bans and other severe restrictions." 46 Fed.Reg. at 5299. This same finding supports DOT's policy decision in Appendix A to deem inconsistent with the Final Rule any nonfederal rule preventing highway transport:

A State cannot make transportation between two points impossible by highway. The radiological risks in transporting large quantity radioactive materials by highway are small and total preclusion of shipments cannot be justified on that basis.

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Id. at 5313; *see id.* at 5317 (49 C.F.R. Part 177, app. A, pt. III(1)). *See also id.* at 5309: “[P]ackages of large quantity radioactive materials can be transported over any Interstate highway, and most other comparable [highway] routes, with a confident level of safety.”

In reaching this conclusion, DOT was aware of the potential for a serious accident in a densely populated area. It stated at one point that the “accident rate is not the only important element to consider in assessing risk to the public—one must consider the consequences of a serious accident, even though the probability of that accident may be small.” *Id.* at 5301. It affirmed at another point that DOT, “also, is concerned with such events [as high consequence accidents] and is mindful of the large economic consequences estimated for such hypothetical events by [the recent SANDIA report]. These estimates relate to a scenario which assumes the worst credible accident for certain truck shipments of spent fuel and polonium in densely populated urban areas.” *Id.* at 5299. Nevertheless, DOT concluded, the potential consequences of such accidents did not warrant allowing a state or locality to prevent highway transport, at bottom because the consequences were highly unlikely, and “these currently low risks will be further minimized by the adoption of driver training requirements and provisions of a method for selecting the safest available highway routes³ for carriers of large quantity radioactive materials, as accomplished in this rule.” *Id.*³

³ The record reflects that driver training will have no “environmentally significant” effect on the radiological hazards. Environmental Assessment, DOT Motion Ex. D at 23. “Most commenters” were “quite cynical” about DOT’s capacity, presumably given its limited budget and past history, to ensure that safety measures will be effective. Summary of Comments, DOT Motion, Ex. E, pt. 1.3.

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DOT stated its position with respect to low-probability/high-consequence accidents in very general terms. "Many commenters," the agency contended, "seem to be concerned only with consequence—particularly high consequence accidents involving large quantity radioactive materials in a heavily populated urban center." *Id.* A proper assessment of the risk of such accidents, DOT said, must be more balanced:

[A]n assessment of risk to the public from accidents involving large quantity radioactive materials should include a balanced consideration of factors which affect both the likelihood of an accident as well as the consequences.

Id. High-consequence accidents should be "of great concern," said DOT, "but not to the extent that public policy on hazardous material routing should be formulated solely on the basis of avoiding such 'worst case' accidents." *Id.* at 5315. *See also id.* at 5300. The probability of such accidents was low enough, in DOT's view, for the overall risk to be deemed acceptable.

If, in addition to low risk, "other factors" were considered by DOT in reaching its conclusion, they were not described as such. Two factors, however, seem to have been considered. First, DOT concluded that public concern over the worst-case accident is irrational, because the same public is willing to bear much greater risks, including the consequences of ordinary highway accidents. *See* p. 1245 *supra*. Second, DOT regarded local laws in particular as highly suspect and likely to reflect public irrationality. Indeed, the Final Rule and its accompanying documents are a veritable essay in political philosophy,

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expressing DOT's skepticism of the capacity of localities to adopt rules worthy of national, or even regional, respect. The rulemaking, DOT noted, was necessary to "consider the overall safety impact of piecemeal, uncoordinated local actions on hazardous material transportation," actions DOT characterized as "narrowly conceived." 46 Fed.Reg. at 5300. Although it noted the argument of "commenters" that, in the United States, local governments have traditionally had primary responsibility for highway safety and for public health, as well as the duty to respond to and clean up after serious accidents, DOT explained:

Local jurisdictions are inherently limited in perspective with respect to establishing routing requirements. While the Department recognizes that local governments are accountable only to their own citizens, such a limited accountability has some undesirable effects.

Id.

While repeatedly expressing its resolve not to examine alternative modes of transport in its rulemaking, DOT nevertheless twice expressed the view that alternative modes would not clearly reduce public risks. Thus, early in its discussion of the Final Rule, DOT stated without elaboration or support:

Other modes of transport generally do not appear to offer alternatives which clearly lower public risks to the extent that use of the highway mode should be substantially restricted.

Id. at 5299. DOT's second comment on the subject, and its most comprehensive statement of its understanding

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of its HMTA responsibilities, is found in the Supplement to Docket HM-164: Summary and Analysis of Public Comments, DOT Motion, Ex. E. In responding to criticism of its decision to refuse to consider alternative modes of transport that might avoid a possible catastrophe, DOT stated that it willingly assumed responsibility for imposing the risk, because the risk was small and could not significantly be reduced by resorting to other modes:

A number of commenters do not share MTB's opinion that this rulemaking be so severely limited. Although none of the proposed or adopted rules pertain to other modes or other hazardous materials the Bureau believes that a discussion of these comments is appropriate.

The most prominent comments addressing this area question MTB's failure to impose a requirement on shippers of large quantity radioactive materials packages to evaluate the risks identified with each mode or combination of modes and then select the method which is most favorable on the basis of the expected impacts on public health and safety. These commenters go on to say that the potential for catastrophe does exist whenever large quantities of radioactive materials are transported in urbanized areas and that it is a proper function of government to safeguard its citizens from such a possible tragedy. In essence MTB finds itself in general agreement with these comments and must conclude that the differences which exist are not of a philosophical nature but rather are represented by varying degrees of protection which rea-

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sonable minds may find difficult in reaching a consensus. [*sic*] When differences such as these cannot otherwise be resolved a judgment must be made by the responsible party. In this case the MTB has primacy over hazardous materials transportation and believes that this exercising of its authority is in order. The determination made by MTB applicable to large quantity radioactive materials packages transported by public highway is that they can be shipped with confidence of an acceptable level of safety and therefore such packages should not be subjected to compulsory modal shifts which result in the fractional reduction of an otherwise low risk. This policy is consistent with MTB's history of recognizing the inherent risks appropriate to the transportation of particular hazardous materials by each of the modes, and its reluctance to specify an order of precedence in the choices available to shippers regarding the physical state of their materials, packagings, quantity amounts, and the like. Such a policy would also not appear to violate recommendations made by the National Council on Radiation Protection (NCRP) concerning the maintenance of dose rates at levels which are "as low as reasonably achievable."

DOT Motion Ex. E. pt. H.2. The same assumptions that led DOT to discount the potential consequences of serious accidents led it to reaffirm its view that the possibility of sabotage did not warrant allowing states or localities to prohibit some shipments through or near densely populated areas. DOT Motion, Ex. E, pt. E at 6.

*Appendix C**C. The City's Nonpreemption Request*

The City responded by letter to DOT's Final Rule on March 20, 1981, criticizing the rule's premises at length, and renewing the City's request for a nonpreemption ruling. City Motion, Ex. N. The City noted that DOT's express declaration in Appendix A rendered the City's regulation inconsistent, but the City insisted that its local ban afforded greater protection without imposing an unreasonable burden on commerce:

The City believes that barging of large quantities of radioactive materials, and in particular spent nuclear fuel, achieve [sic] a level of safety greater than the highway transport authorized by the DOT rule, and at the same time, no unreasonable burden on commerce will be imposed.

Id. at 2. The City's letter referred again to NUREG-0170's recognition of barging as a possibly viable alternative, and to a site-specific study confirming that barging could be used for spent fuel from the Shoreham Nuclear Station. Barging, the City noted, has already been successfully used by Brookhaven National Laboratories and by others, and would make a serious accident much less likely. The letter asserted in particular: "Barge shipments to highway points avoiding New York City will *eliminate* the risk to the City's residents and, at the same time, produce no increased risk of exposure to residents of other localities if the interconnection points between barge and highway are south of New York City." *Id.* at 4 (emphasis added).

DOT responded to this request by letter dated April 22, 1981. City Motion, Ex. O. It stated that the MTB

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"will need to develop more information concerning the safety level and commercial burden associated with § 175-111 of the City's Health Code before reaching a conclusion," and proposed to extend the comment period until further notice, a proposal in which the City acquiesced. City Motion, Ex. P. DOT took no further action on the City's request until after a meeting of DOT personnel with City representatives on December 21, 1981. At that time the City requested "a preliminary response to its March 20, 1981, application for a non-preemption determination." The Court, in an Order entered on January 4, 1982, also requested DOT to state its position on the City's application.

On January 15, 1982, DOT sent the City a seven-page letter, detailing the weaknesses and flaws in its nonpreemption request. Letter from Alan I. Roberts to Stephen P. Kramer (Jan. 15, 1982). The City's regulation, DOT wrote, "is precisely the type of requirement . . . that led to the adoption of the regulations with which the City's requirement is inconsistent," because the Department had already concluded that the public risks of highway transport were too low to justify local government bans such as the City's. *Id.* at 2. Even if the ban provided greater safety without unreasonably burdening commerce, a nonpreemption ruling might not be granted. The City, DOT said, "must make a clear demonstration that, because of its peculiar circumstances, it is entitled to an exception from the general rules of HM-164. . . . Without such a demonstration, the exception permitted by a non-preemption determination would, in effect, 'swallow the rule' and severely undermine the policies underlying HM-164." *Id.* The legislative history "clearly indicates that" inconsistent requirements are to be deemed

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nonpreempted only when "shown to be clearly necessary." *Id.* The City had failed in its application to demonstrate the exceptional circumstances required, because the application relied on the same studies DOT had used in reaching its conclusion that the risks of radioactive materials transport by highway are too low to justify local bans; because NRC itself had recently concurred in DOT's conclusion; and because the "general statements" and "anecdotes" relied on by the City to establish the feasibility of barging were "of little value to DOT in attempting to determine the extent of increased costs and impairment of efficiency resulting from the City's requirements." *Id.* at 3. The City, moreover, relied "on a 'worst-case' approach to safety analysis which considers only the possible consequences of an accident and ignores the probability that such consequences would ever occur." *Id.* HM-164 had "explicitly rejected the worst-case approach to safety analysis," requiring that routing policy be based also upon "all other factors which contribute to the overall risk involved in transporting large quantity radioactive materials." *Id.*

Before DOT would proceed further with the City's application, the City was required to provide "a detailed analysis" comparing the levels of safety and cost resulting from its regulation with those achieved by HM-164. The City would also have to identify in any renewed application all parts of "the public" affected by its proposal, *id.* at 4, and then estimate the risks from accident-free transport and from accidental release, on all population groups, for both the highway and barge alternatives. In addition, the City would have to perform an analysis of comparative costs, including initial capital investments and operating costs. *Id.* at 3-5. "The

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Department appreciates the degree of effort on the part of the City that the analysis described above will require. However, it is our firm view that that effort is required in order to substantiate the determinations required by § 112(b)." *Id.* at 5. Noting that Congress was considering a bill to require DOT to undertake the burden of analysis it was placing on the City, DOT expressed its willingness to hold open the City's requests pending Congress' action on the bill "[i]f the City considers the analysis discussed above to be beyond its capabilities." *Id.* The letter concluded with several technical objections that have little if any substantive significance, but do reflect the Department's hostility towards the City's application.⁴

⁴ First, the letter announced that the City had failed to provide DOT with the text of the regulation for which it had sought a non-preemption ruling. This failure was excused "[f]or purposes of this response." *Id.* Second, the City had not clearly enough acknowledged that its regulation was inconsistent with DOT's rule. The City had acknowledged that its regulation was inconsistent with Appendix A, correctly noting that, without the Appendix, DOT's rule could be read to permit the City in effect to require bargaining. Although DOT in its letter ruled expressly that the City's regulation was inconsistent, DOT informed the City that it "must acknowledge that inconsistency." *Id.* at 6. Third, the City had failed to demonstrate that, assuming its regulation provided greater safety, the City would continue "to administer and enforce effectively such requirement." The City's renewed application would have to show in advance of any nonpreemption ruling that it would satisfy that aspect of § 112(b), even though the provision seems intended to apply only after a nonpreemption ruling is rendered. *Id.* Finally, DOT asserted that HMTA requires any nonpreemption application to be made by a "State

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DOT's letter is clearly a ruling rejecting the City's application as filed in March 1981, and mandating a massive demonstration by the City. The letter imposing these demands was written, moreover, nine months after the agency informed the City that its own MTB was collecting the material necessary to evaluate the City's request, and only fifteen days before DOT's rule was scheduled to take effect. DOT thereby effectively precluded the City from preparing a more detailed presentation and obtaining a definitive ruling on the merits of its application prior to the date on which the City's ban was scheduled to be rendered unenforceable.

II. DOT's Authority to Adopt HM-164

The City and State of New York present several challenges to DOT's authority to adopt its Final Rule, including Appendix A. The State claims that HMTA unconstitutionally delegates legislative authority to DOT, and that the Final Rule violates the Tenth Amendment

(Footnote continued from preceding page)

agency," which DOT read to exclude the City. The letter acknowledged that DOT's Final Rule, specifically 49 C.F.R. 107.215(a), expressly permitted either a state or its political subdivision to apply for nonpreemption rulings. But now, in considering the City's application, DOT implicitly found its recently adopted regulation inconsistent with HMTA and insisted on the City's obtaining sponsorship from New York State. *Id.* at 6-7.

The Court has been provided with no further information concerning the City's application, although at oral argument on the cross-motions for summary judgment, the State of New York made clear its willingness to sponsor the City's application for nonpreemption, if required by law.

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of the Constitution of the United States by interfering unjustifiably with matters of state concern. Both plaintiffs argue that the Final Rule is unauthorized by HMTA, in that the statute permits only regulations that "promote" safety in every particular application. Finally, both contend that HMTA's preemption provision implicitly prevents DOT from adopting regulations that preempt local rules that provide no less safety than the regulation proposed and that do not unreasonably burden commerce. None of these arguments is valid.

A. Constitutionality of HMTA's Delegations

Congress lawfully delegated to DOT both its rule-making authority and the authority, under 49 U.S.C. § 1811(b) (1976), to make nonpreemption determinations. The rulemaking authority is constrained by the requirement that regulations rationally seek to protect the public from the risks of transporting hazardous materials. *Id.* § 1804(a). The nonpreemption decision is governed by the requirement that the non-federal rule both promote public safety no less than the federal rule and not unreasonably burden commerce. *Id.* § 1811(b). Both standards call for technical decisions that fall within DOT's area of expertise, and the public-safety standard is "sufficiently precise to apprise DOT both of its regulatory mission and the means to carry it out." Memorandum of Law in Support of Motion for Summary Judgment by Defendant-Intervenors at 60. With respect to both these powers, therefore, HMTA's delegations pass constitutional muster because Congress laid down sufficiently intelligible principles and clearly defined standards in

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one of DOT's "areas of expertise." *National Nutritional Foods Ass'n v. Weinberger*, 512 F.2d 688, 696 (2d Cir.), cert. denied, 423 U.S. 827, 96 S.Ct. 44, 46 L.Ed.2d 445 (1975); *Currin v. Wallace*, 306 U.S. 1, 59 S.Ct. 379, 83 L.Ed. 441 (1939).

B. Validity of HM-164 Under the Tenth Amendment

HMTA, and in particular its preemption provision, 49 U.S.C. § 1811(a) (1976), are well within the commerce power of Congress. "[W]hen Congress has determined that an activity affects interstate commerce, the courts need inquire only whether the finding is rational." *Hodel v. Virginia Surface Mining and Reclamation Ass'n*, 452 U.S. 264, 101 S.Ct. 2352, 2360, 69 L.Ed. 2d 1 (1981). Congress' determination that the transportation of hazardous materials affects interstate commerce is rational. The spent fuel from the Brookhaven facility that is at issue in this case would, if the DOT regulations take effect, be trucked on Interstate highways across the New York border into New Jersey and eventually to upstate New York or South Carolina for storage. Further, the means adopted by Congress are "reasonably adapted to the end permitted by the Constitution." *Id.* at 2360. In order "to protect the Nation adequately against the risks to life and property which are inherent in the transportation of hazardous materials in commerce," 49 U.S.C. § 1801 (1976), Congress provided for preemption on the reasonable ground that state and local regulations might otherwise lessen the degree of safety provided by uniform federal rules, or might interfere unreasonably with the unimpeded and safe flow of com-

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merce. S.Rep.No.1192, 93d Cong., 2d Sess. 6-9, 37-38 (1974); see *Hodel v. Virginia Surface Mining and Reclamation Ass'n*, *supra*, 101 S.Ct. at 2362; *Ray v. Atlantic Richfield Co.*, 435 U.S. 161, 165-66, 98 S.Ct. 988, 995, 55 L.Ed.2d 179 (1978).

Nothing in the Tenth Amendment to the Constitution undermines the validity of HMTA or of its preemption provision. As the Supreme Court recently said in *Hodel v. Virginia Surface Mining and Reclamation Ass'n*, *supra*, 101 S.Ct. at 2367-68, "the Tenth Amendment [does not limit] congressional power to pre-empt or displace state regulation of private activities affecting interstate commerce . . . regardless of whether the federal legislation displaces laws enacted under the States' 'police powers.'" Moreover, HMTA does not impair Tenth Amendment rights recognized in *National League of Cities v. Usery*, 426 U.S. 833, 96 S.Ct. 2465, 49 L.Ed.2d 245 (1976). It neither "regulates the 'States as States,'" nor "addresses matters that are indisputably attributes of state sovereignty," nor impairs the ability of states "to structure integral operations in areas of traditional functions." *Hodel v. Virginia Surface Mining and Reclamation Ass'n*, *supra*, 101 S.Ct. at 2366 (quoting *National League of Cities v. Usery*, *supra*, 426 U.S. at 845, 852, 854, 96 S.Ct. at 2471, 2474, 2475). Indeed,

[t]he regulation of traffic on roads and highways with its strong regional and interstate character (particularly in the New York City metropolitan area), has long been considered to be a cooperative effort between City, State and federal authorities, with no single entity being able to provide or impose a comprehensive traffic system, and with federal power, where necessary, taking precedence.

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Friends of the Earth v. Carey, 552 F.2d 25, 38 (2d Cir.), cert. denied, 434 U.S. 902, 98 S.Ct. 296, 54 L.Ed.2d 188 (1977) (citations omitted).

C. DOT's Authority to Regulate the Transportation of Radioactive Materials

New York State argues broadly that DOT has exceeded its authority under HMTA by regulating so as to permit the freer transport of a hazardous substance, without a finding of increased safety. HMTA's declared policy is to increase the authority of the Secretary of Transportation "to protect the Nation adequately against the risks to life and property which are inherent in the transportation of hazardous materials in commerce." 49 U.S.C. § 1801 (1976) (emphasis added). Radioactive materials have been designated "hazardous," in that their transportation in commerce "may pose an unreasonable risk to health and safety or property." *Id.* § 1802(2); see 49 C.F.R. § 171.8 (1980). And the Secretary's power to issue regulations is expressed in terms of enhancing "the safe transportation in commerce of hazardous materials" and of governing "any safety aspect of" such transportation. 49 U.S.C. § 1804(a) (1976) (emphasis added). From these premises the State argues that DOT may not lawfully deem the transport of "hazardous" radioactive material to be safe, or preempt a local rule regulating the transport of material deemed "hazardous" without finding that the local rule renders such transport less safe than DOT's rule.

DOT's authority cannot be so artificially limited. HMTA specifically authorizes regulations governing all

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aspects of the transportation of radioactive materials, including routing. *Id.* § 1804(a). Congress therefore contemplated that routing rules could advance HMTA's goal of protecting the public. Furthermore, the designation of a material as hazardous does not necessarily establish that its transport under a particular regulatory scheme is hazardous. DOT could reasonably conclude under the Act that a particular method and route for transporting such a material in fact creates no significant hazard. DOT is also well within its authority to increase risks in one area or on one route, if it acts reasonably to establish an overall scheme for the safe and efficient transport of hazardous materials. In the present rulemaking DOT concluded that the interests of safety and efficiency required it to establish a national plan for transporting radioactive materials to stem and offset the proliferation of state and local rules. 46 Fed. Reg. at 5299. The Final Rule is in general thus reasonably within DOT's authority.

The State also challenges DOT's assertion that the Final Rule was needed to enhance safety or efficiency. In fact, DOT's Environmental Assessment concludes that, even if DOT had taken no action, the consequences would be "speculative." City Motion, Ex. H at 25. The Assessment anticipates more local rules, but recognizes that "[t]hose impacts could involve both increases and decreases in accident risk and normal dose." *Id.* at 9. Furthermore, with respect to efficiency, the Assessment could only report that the no-action costs "could be substantial" if by 1985, for example, localities enact restrictions so as to increase travel distances and times by 25%. *Id.* No estimates were made, however, "because of the uncertain nature of future state and local actions." *Id.*

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The State's analysis is acute, in that it supports the argument that DOT's concern has been to facilitate transport by preventing state and local interference irrespective of their speculative costs and possible enhancement of safety. But the attack is so broad that it would leave too little latitude to a national regulatory body's judgment on the need for uniformity and certainty. The DOT is vested by Congress with responsibility not only to deal with problems it reasonably concludes might arise. The record contains an ample basis for DOT's preceptions that the existing multiplicity of laws presents dangers both to efficiency and to safety. Finally, and most concretely, the Final Rule does not merely override state and local rules. It also adopts many measures that are expressly and incontrovertibly designed to enhance safety, including, for example, enhanced driver training and protection against theft or sabotage. DOT takes pains to establish that the Final Rule will facilitate the shipment not only of spent fuel but also of small-quantity medical supplies, which it finds has been obstructed. *See* 46 Fed. Reg. at 5299. The State's broad attack on DOT's regulatory authority is therefore rejected.

D. Effect of HMTA's Preemption Provisions on DOT's Authority

Section 112(a) of HMTA provides for blanket preemption of nonfederal requirements inconsistent with validly promulgated federal rules, "[e]xcept as provided in subsection (b)." 49 U.S.C. § 1811(a) (1976). Section 112(b) permits the Secretary of Transportation to waive preemption for a nonfederal rule that protects the public at least as well as the inconsistent federal requirement and does

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not unreasonably burden commerce. *Id.* § 1811(b).⁵ In setting up this two-part preemption structure, Congress intended that states and localities would retain some role in the regulation of hazardous-materials transportation but that, once valid federal regulations were issued, inconsistent nonfederal requirements would be preempted unless the Secretary of Transportation grants a waiver.

The City correctly assumes that only a *valid* federal regulation can have any preemptive effect. In fact, insofar as DOT's Final Rule is found invalid in this proceeding, it has no preemptive effect on the City's regulation. The City's regulation may, however, apply to some shipments of radioactive materials that could not conceivably cause a high-consequence accident. Other state or local

⁵ Section 112, 49 U.S.C. § 1811 (1976), provides:

(a) Except as provided in subsection (b) of this section, any requirement, of a State or political subdivision thereof, which is inconsistent with any requirement set forth in this chapter, or in a regulation issued under this chapter, is preempted.

(b) Any requirement, of a State or political subdivision thereof, which is not consistent with any requirement set forth in this chapter, or in a regulation issued under this chapter, is not preempted if, upon the application of an appropriate State agency, the Secretary determines, in accordance with procedures to be prescribed by regulation, that such requirement (1) affords an equal or greater level of protection to the public than is afforded by the requirements of this chapter or of regulations issued under this chapter and (2) does not unreasonably burden commerce. Such requirement shall not be preempted to the extent specified in such determination by the Secretary for so long as such State or political subdivision thereof continues to administer and enforce effectively such requirements.

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regulations may also apply to aspects of radiocative-materials transport that are validly regulated by DOT. To the extent the City or other nonfederal entities have regulations that are inconsistent with valid aspects of DOT's Final Rule, they are unenforceable until and unless they are authoritatively deemed nonpreempted.

The City and State argue that, even to the extent the Final Rule is valid, it cannot be given preemptive effect over a state or local law that in fact affords equal or greater protection to the public without unreasonably burdening commerce. They refer particularly to the language of section 112(b), which provides that an inconsistent nonfederal requirement "is not preempted if, upon the application of an appropriate State agency, the Secretary determines" that the requirement meets the specified criteria. *Id.* § 1811(b). Under this view, a nonfederal rule would be preempted only after DOT had found that it failed to meet the criteria of § 112(b). DOT would have to pass on every particular rule asserted to meet the § 112(b) tests; it could not deem entire groups of such rules inconsistent with its regulations, and thereby render them unenforceable, as it purports to have done in Appendix A of its Final Rule.

These arguments are refuted by the language of HMTA, by its legislative history, and by the practical necessities of the regulatory process. The statutory language of § 112 expressly contemplates both an application for nonpreemption by the nonfederal authority and a determination of nonpreemption by the Secretary before preemption is avoided. The nonfederal requirement may in fact provide greater public safety than the federal requirement and may in fact impose no unreasonable burden on commerce. But the statute says that the nonfederal

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rule is preempted if it is inconsistent, unless a nonpreemption ruling is obtained. It follows that, where no application for a nonpreemption ruling has been made with respect to an inconsistent nonfederal rule, it is unenforceable. Nor is the mere application by a state or local authority for a nonpreemption ruling enough to permit enforcement of a nonfederal rule properly found to be inconsistent. Where Congress has intended to permit nonfederal regulations to stand until a federal authority has ruled otherwise, it has expressly said so. *Compare, e.g.,* 15 U.S.C. § 1693q (Supp. II 1978) (Electronic Fund Transfer Act (EFTA) supplements laws of any state relating to electronic fund transfers, except to extent that those laws are inconsistent with EFTA; state law is not inconsistent with EFTA if it affords consumers greater protection; and Federal Reserve Board, upon request of interested party, shall "determine whether a State requirement is inconsistent or affords greater protection").

The legislative history of Congress' adoption of HMTA's preemption provision also indicates that an inconsistent nonfederal rule is unenforceable until completion of the § 112(b) process. The nonpreemption provision originated in the Senate and was adopted by the Conference Committee. *See* S.Rep.No. 1347, 93 Cong., 2d Sess. 25 (1974), U.S. Code Cong. & Admin.News 1974, p. 7669. The Senate Committee on Commerce described its intention in adopting the provision as follows:

This section sets out the general guidelines for how this bill, and regulations promulgated under it, are to interact with certain other Federal laws and with the laws of States and other political subdivisions. The Committee endorses the principle of Federal preemption in order to preclude a multiplicity of

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State and local regulations and the potential for varying as well as conflicting regulations in the area of hazardous materials transportation. However, the Committee is aware that certain exceptional circumstances may necessitate immediate action to secure more stringent regulations. For the purpose of meeting such emergency situations, the Committee has provided that any State or political subdivision may request, and the Secretary may grant, approval of regulations which vary from Federal regulations, provided that they are equivalent or more stringent and place no burden on interstate commerce.

Subsection (a) sets out the general rule that conflicting laws of States and other political subdivisions are preempted.

Subsection (b) sets up the mechanism by which a State or other political subdivision can apply to avoid preemption upon a showing that the regulation in question provides protection that is equal to or better than that provided by the Federal regulation.

S.Rep.No. 1192, 93d Cong., 2d Sess. 37-38 (1974). To read section 112 as permitting a nonfederal authority to treat an inconsistent rule as effective prior to obtaining a waiver from DOT would be inconsistent with the Senate Committee's expressed understanding. The Committee contemplated that the "general rule" was preemption and that nonpreemption would occur because "exceptional circumstances may necessitate immediate action." Even in "such emergency situations," Congress did not provide for a nonfederal decision; rather, it stated that the Secretary

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“may” grant nonpreemption on a “showing that the regulation in question provides protection that is equal to or better than that provided by the Federal regulation.”

The City's reading of section 112, moreover, would be inconsistent with Congress' intention “to preclude a multiplicity of State and local regulations and the potential for varying as well as conflicting regulations in the area of hazardous materials transportation.” *Id.* HMTA provides explicitly for the preemption of nonfederal requirements inconsistent with validly promulgated federal regulations because Congress believed that substantial uniformity in the rules governing the transportation of hazardous materials is an important means of pursuing the statutory objectives of protecting both public safety and the unimpeded flow of interstate commerce. Permitting nonfederal rules to remain in effect until DOT refuses to grant nonpreemption rulings would require DOT to pass on requests for waivers from every jurisdiction that applied for a ruling before being able effectively to enforce federal rules. Because extensive analysis is required before a proper ruling on a nonpreemption application, such a duty might severely undermine DOT's capacity to regulate effectively.

Plaintiffs also argue that DOT may not in advance deem entire categories or types of nonfederal rules inconsistent with a federal regulation. They attack DOT's authority to adopt Appendix A to 49 C.F.R. Part 177, which expressly determines, among other things, that any local rule that bans highway transport between any two points is inconsistent with the Final Rule. In this case, that particular determination is invalid insofar as it relates to bans on transport of large-quantity shipments through densely populated areas. It may also be in-

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valid in other respects, not resolved in this litigation. As a general regulatory device, however, and to the extent it is based on a valid, underlying federal regulation, DOT's use of an advance declaration of inconsistency is proper and within its authority under HMTA.

DOT's placement of the declaration of inconsistency in an appendix to its regulation in no way detracts from its official character. The policy announced in Appendix A was no surprise; it was part of the regulations themselves as announced in the notice of proposed rulemaking. The full procedural panoply applicable to all other regulatory rules has been applied to the policy in Appendix A, so it can fairly be treated as a component of the regulations themselves. Alternatively, even if the policy announced in the appendix is treated as DOT's interpretation of its own regulations, it was announced beforehand and adopted with a reasoned explanation of its contents and purpose. Consequently, its validity must be judged by its reasonableness and necessity, not by its form.

An advance determination of inconsistency, whether as part of a regulation or as an interpretive declaration, can serve valid and important regulatory needs. HMTA establishes a structure that unquestionably contemplates that states and localities will continue to exercise their police powers over highway transport and health, areas traditionally within the realm of nonfederal concerns. In some instances, federal regulations might be susceptible of readings that lead state or local authorities reasonably to treat their laws as consistent with the federal regulations. Absent an inconsistency determination, *see* 49 C.F.R. § 107.203-211, the nonfederal rules would remain in force, and therefore might pose a threat to the effectiveness of a federal regulatory initiative. In

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such a circumstance, DOT might have a sufficient basis reasonably to declare a type or category of nonfederal rule inconsistent with DOT's rule so as to avoid interference with a federal program. For example, in a particular rulemaking, DOT might conclude that certain hazardous shipments should be moved by convoy at speeds not exceeding 20 m.p.h. Many states and localities might have laws that set minimum speeds in excess of 20 m.p.h. on routes over which the shipments involved would be required to travel. Assuming that DOT properly and reasonably determined that alternative routes that have no state or local minimum speed are either unavailable or less desirable, DOT could properly declare in advance that nonfederated minimum speeds in excess of those required by federal regulation were inconsistent with federal law to the extent they applied to the shipments involved.

This example reflects the need DOT might have to issue advance declarations of inconsistency, and hence establishes the legitimacy in principle of the device adopted in Appendix A. The example also illustrates, however, the limitations that must be read into the use of such a device to make its exercise reasonable and consistent with HMTA. Before making such an inconsistency ruling, DOT must have an adequate basis in language, policy, and need to support its pronouncement. These limitations are implicit in the manner in which Congress has legislated in HMTA. Judged by any of the traditional judicial tests for determining federal preemption of a field of regulation, HMTA must be read to recognize a significant role for nonfederal authorities, a role that DOT must respect in its inconsistency rulings as well as in its general rulemaking. See *City of Burbank v. Lockheed Air Terminal, Inc.*, 411 U.S. 624, 633, 93 S.Ct.

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1854, 1859, 36 L.Ed.2d 547 (1973); *Guss v. Utah Labor Relations Bd.*, 353 U.S. 1, 10-12, 77 S.Ct. 598, 602, 603, 1 L.Ed.2d 601 (1957); *Pennsylvania v. Nelson*, 350 U.S. 497, 504-05, 76 S.Ct. 477, 381, 100 L.Ed. 640 (1956); *Rice v. Santa Fe Elevator Corp.*, 331 U.S. 218, 229-36, 67 S.Ct. 1146, 1151-55, 91 L.Ed. 1447 (1947); *Hines v. Davidowitz*, 312 U.S. 52, 67 S.Ct. 399, 404, 85 L.Ed. 581 (1941). See generally Comment, *Preemption Doctrine in the Environmental Context: A Unified Method of Analysis*, 127 U.Pa. L.Rev. 197, 199-208 (1978). Congress intended that DOT respect the traditional and legitimate interest of state and local jurisdictions in promoting public safety, an interest that has been tangibly defined by DOT and the courts, so as to provide meaningful guidance. See, e.g., 49 U.S.C. § 1651(b)(1) (1976); 49 C.F.R. § 390.30 (1980); 43 Fed.Reg. 5300-02 (1981); *Friends of the Earth v. Carey*, *supra*, 552 F.2d at 38; *City of New York v. Ritter Transportation Inc.*, 515 F.Supp. 663, 668-72 (S.D.N.Y. 1981); *South Carolina State Highway Dep't v. Barnwell Bros. Inc.*, 303 U.S. 177, 190, 58 S.Ct. 510, 516, 82 L.Ed. 734 (1938). As DOT itself has said, "the history of [DOT regulation of] highway carriage has been one of an accommodation [*sic*] of Federal and State interests that is pragramtic and that recognizes, as have the courts, that local interest in highway safety is well established and proper, and that a local exercise of police powers in support of that interest is not to be lightly displaced." 43 Fed. Reg. 1654-55 (1978). DOT, in short, may not regulate in the field as if writing on a clean slate.

No need exists to determine the legality of Appendix A further than to state that DOT cannot effectively declare nonfederal laws inconsistent on the basis of an invalid federal rule. In principle, the device represented

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by the appendix is proper, however, and to the extent that it rests on valid regulations, fairly construed and reasonably necessary to advance HMTA's purposes, it must be deemed to achieve its intended effect.

II. Adequacy of DOT's Environmental Evaluation

Plaintiffs point to numerous alleged deficiencies in DOT's environmental evaluation. They assert that DOT could not properly rely on dated studies, conducted by or for other federal agencies, as a substitute for its own work; that DOT was required to prepare an Environmental Impact Statement ("EIS"); that the record does not reflect that DOT adequately considered a variety of matters, including cask integrity, human error, sabotage, its own accident data, and alternative modes of transport; and that DOT failed to consider separately and in sufficient depth the problem of environmental assessment posed by the low-probability/high-consequence accident in densely populated areas.

Defendants reply that HM-164 is the product of almost three years of regulatory planning, during which the agency solicited and heard all points of view. The agency concededly has not prepared an EIS; nor has it supervised or conducted its own environmental study. But these steps were unnecessary under the circumstances, defendants contend. DOT used thorough reports on the subject, prepared by or for other government agencies. On the basis of these reports, DOT compiled a Regulatory Evaluation and Environmental Assessment, which defendants contend is all that is required, because the evidence shows that the risks of highway transport are so low that DOT could reasonably conclude that HM-164 will have no sig-

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nificant adverse environmental impact. In addition, the defendants note, DOT analyzed the environmental problems concerning its Final Rule in its proposed rulemaking, in HM-164 itself, in Appendix A to the Final Rule, and in a Summary and Analysis of Public Comments. Defendants argue that these sources in combination consider all the relevant issues, including the fears generated by the "worst-case" scenario. Defendants contend, in fact, that DOT has considered alternative modes of transport, at least sufficiently to conclude that they will not significantly reduce the risks at issue.

With respect to most of what DOT has done, defendants' arguments are sound. The agency has heard all points of view, and has satisfied the procedural requirements of the Administrative Procedure Act for notice and comment rulemaking. DOT may properly use the reports of other agencies in evaluating the environmental impact of HM-164; indeed, NEPA regulations encourage the use of such reports. 40 C.F.R. §§ 1500.4(n), 1506.4 (1981). Certainly, DOT has an obligation independently to evaluate what others have done for it. *Id.* § 1507.2. But if such reports satisfy an agency's obligation to study the potential effects of its proposed action, then the agency has no obligation to prepare its own study. If the literature considered provides an adequate basis for a finding of no significant environmental impact, then the agency may make such a finding in an abbreviated environmental assessment, rather than in an EIS. *Id.* § 1508.9. *Hanly v. Kleindienst*, 471 F.2d 823, 830 (2d Cir. 1972), *cert. denied*, 412 U.S. 908, 93 S.Ct. 2290, 36 L.Ed.2d 974 (1973). Moreover, if the risks associated with a particular form of transport are negligible DOT can under NEPA reasonably conclude it is unnecessary even to examine the feasibility

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of alternative modes before permitting the mode under consideration to be used.

In apply these principles to the record compiled by DOT it is apparent DOT had ample evidence to support many of its findings and assumptions. NUREG-0170 is a perfectly proper source for DOT's assessment. The report constitutes an assessment of the environmental impact of shipping radioactive materials into, within, and out of the United States.⁶ That study, like DOT's present rule, commenced as an examination of a single mode of transportation, in that case, air shipment. It was expanded to other modes, however, in order to examine the environmental impact of alternatives." NUREG-0170 at iii. It concludes that nonaccident exposure to highway transport of radioactive materials has very limited effects on health, and that the "expected values of the annual radiological impact" from accidents are "very small, estimated to be about one latent cancer fatality and one genetic effect for two hundred years of shipping at 1975 rates." *Id.* at iv-v. The report also concludes that, although a major accident could occur, the consequences would be severe only for a very limited number of large-quantity shipments of high-toxicity dispersibles. The report also provides general support for DOT's conclusion that alternative modes or

⁶ The report was intended to serve as background material for a review by NRC of regulations dealing with transportation of radioactive substances. It recognizes that the impetus for a review resulted from "a general need to examine regulations to ensure their continuing consistency with the goal of limiting radiological impact to a level that is as low as reasonably achievable" and "also from a need to respond to current national discussions of the safety and security aspects of nuclear fuel cycle materials." NUREG-0170 at xxi.

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methods of transport do "not significantly reduce the radiological impact." *Id.* at vi. Based on the report, the NRC staff "determined that the environmental impacts of normal transportation of radioactive material and the risks attendant to accidents involving radioactive material shipments are sufficiently small to allow continued shipments by all modes." *Id.* at viii. Although DOT at no point referred in detail to NUREG's analysis of the sabotage problem, the NUREG Report concludes that existing physical security requirements are adequate to protect against theft or sabotage of strategic materials. On the basis of these findings the NRC staff concluded that "the risks" of theft or sabotage resulting in any significant radiological release "are sufficiently small to constitute no major adverse impact on the environment." *Id.* at ix.

The SANDIA report, published in July 1980, is also a proper source for DOT's assessment, and its supports many of DOT's conclusions. That report was undertaken for the specific purpose of evaluating the potential consequences of transporting radioactive materials through urban areas. If fact, the report is a study of transport through New York City; conclusions are then extended to other urban areas. On the basis of a more refined analysis of urban-area characteristics than was possible in NUREG-0170, the report concurs with NUREG-0170's general conclusions that neither accident-free transport nor the overall expected effects of accidents poses a significant hazard to urban populations. SANDIA at 36-40, 68. SANDIA treats major accidents as possible but highly unlikely. *Id.* at 66. It makes higher estimates than NUREG-0170's, however, of the expected consequences of extremely severe accidents. See pp. 1271-1276 *infra*. Nevertheless SANDIA supports at least DOT's conclusion regarding the effect of such ac-

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cidents on overall risks: "Since these accidents have very low probabilities of occurrence, they do not contribute significantly to the total expected values of risk." SANDIA at 68.

SANDIA also considers the expected environmental effects of human error, which it finds are minimal. Although SANDIA notes the possibility of "synergisms that would connect the human error with a vehicular accident," *id.* at 84, its separate analysis of this subject increases the base of data that arguably justifies DOT's rule. The report also examines the feasibility and expected consequences of several alternatives to transport through urban areas. Here, again, DOT's general conclusion is supported with respect to the alternatives considered: "A general conclusion that can be drawn is that, for the most part, implementation of any single alternative produces less than an order of magnitude change in the calculated radiological risks." *Id.* at 173. Finally, SANDIA contains a summary of a study of "Social Impacts" potentially caused by transport of radioactive materials in urban areas. *Id.* at L-1 to L-14. Although many of the conclusions in the summary raise doubts about the sufficiency of DOT's consideration of social impacts, the presence of the summary and DOT's willingness to hear all points of view on its proposals arguably satisfy any obligation it may have to show that the issue was raised. These materials, together with DOT's Final Rule, the Environmental Assessment, and its Summary of Comments, demonstrate that plaintiffs understate the extent of DOT's consideration of the issues. They establish, in fact, an ample basis for all of DOT's actions challenged in this proceeding, except those that relate to the transportation of spent fuel and other large-quantity radioactive materials through densely populated areas.

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With respect to shipments of spent fuel and other large-quantity radioactive materials, however, DOT failed in HM-164 to fulfill its NEPA obligations. The Supreme Court has made clear that, although NEPA sets "significant substantive goals for the Nation"—in general, to encourage efforts to prevent damage to the environment and to protect human welfare and health, 42 U.S.C. § 4321 (1976)—the duties it imposes on federal agencies are "essentially procedural." *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc.*, 435 U.S. 519, 558, 98 S.Ct. 1197, 1219, 55 L.Ed.2d 460 (1978). NEPA does not dictate to agencies the weight to attribute to the non-environmental factors bearing on a particular decision. *Stryker's Bay Neighborhood Council, Inc. v. Karlen*, 444 U.S. 223, 100 S.Ct. 497, 62 L.Ed.2d 433 (1980). Rather, in NEPA Congress sought to channel administrative decisionmaking to ensure that judgments affecting the human environment are informed by full and thoughtful evaluation of the potential environmental impact of proposed federal actions. *See id.* at 227, 100 S.Ct. at 499; *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21, 96 S.Ct. 2718, 2730 n.21, 49 L.Ed.2d 576 (1976); *Minnesota Public Interest Research Group v. Butz*, 541 F.2d 1292, 1300-01 (8th Cir. 1976). It is fundamental to this process that the agency must take "'a hard look' at environmental consequences," *Kleppe v. Sierra Club*, *supra*, 427 U.S. at 410 n.21, 96 S.Ct. at 2730, n.21, and, whenever a proposal may have some environmental impact, that it must "study, develop, and describe appropriate alternatives to recommended courses of action." 42 U.S.C. §4332(2)(E); *Trinity Episcopal School Corp. v. Romney*, 523 F.2d 88-93 (2d Cir. 1975). Careful adherence to NEPA procedures is demanding, but it is of vital importance. The Interagency Review Group on

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Nuclear Waste Management recently "reiterate[d] in the strongest possible way its commitment to the careful application of the NEPA process and other step-wise decisionmaking processes." IRG Report 21.

Central to the procedural scheme established in NEPA is the requirement that an agency "include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment" a detailed environmental impact statement ("EIS"). 42 U.S.C. § 4332(2) (C) (1976). In this case, DOT found that highway transport of radioactive materials causes no significant impact on the human environment. It therefore decided that an EIS was unnecessary, and insofar as DOT's regulation relates to highway transport of materials insufficiently toxic to cause great harm in the event of an accident, the Department's finding of no significant impact is reasonable. But to the extent the regulation mandates the transport through densely populated areas of other materials—in particular, of spent fuel and other large-quantity radioactive materials—against the will of local and state legislatures, the finding is arbitrary and capricious on this record. DOT also failed in HM-164 to satisfy its NEPA obligation to consider alternatives to the highway mode for transporting spent fuel and other large-quantity radioactive materials. Had the agency prepared an EIS, it would have been required by statute to provide a detailed description of reasonable alternatives to its proposal. 42 U.S.C. § 4332(2)(C)(iii). Assuming, however, that DOT could reasonably conclude on this record that its action had no significant impact on the environment, it was nevertheless required under the circumstances presented to study, develop and describe alternatives. *Id.* § 4332(2)(E).

*Appendix C**A. DOT's Examination of Environmental Consequences and Finding of No Significant Impact*

The central issue in this litigation is the significance DOT is required to accord the public risks associated with the unlikely possibility of a catastrophic accident. The issue is substantive, and its resolution depends on DOT's obligations under HMTA, *see* pp. 1287-1292 *infra*, not on its duties under NEPA, which does not by itself prescribe substantive results. *See Strykers Bay Neighborhood Ass'n v. Karlen, supra*, 444 U.S. 223, 100S.Ct. 497, 62 L.Ed.2d 433. NEPA does, however, provide a procedural framework within which substantive judgments must be made. An agency may be free to decide, in some circumstances, that the public should be subjected to grave risks; it may even be required by Congress to do so. But NEPA requires every agency to pay attention to the environmental consequences of actions it contemplates in performing its substantive duties. The Council on Environmental Quality explains how NEPA relates to agencies' substantive duties:

NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA. Most important, NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail.

Ultimately, of course, it is not better documents but better decisions that count. NEPA's purpose

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is not to generate paperwork—even excellent paperwork—but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment. [NEPA and] [t]hese regulations provide the direction to achieve this purpose.

40 C.F.R. § 1500.1(b) and (c) (1981).

DOT's duty to inform itself adequately of the public risks at issue has three distinct but related sources. First, as discussed in detail below, adequate risk assessment is a fundamental first step to performing its obligation under HMTA rationally to decide how to route large-quantity radioactive materials and to use all reasonable means to avoid even small risks of catastrophic consequences not inherent in the transportation of hazardous substances. Second, NEPA requires adequate assessment of "impact" and potential environmental consequences in order to aid the agency in fulfilling the aim of NEPA and of DOT's implementing regulations to minimize or avoid all adverse environmental effects. *See* 42 U.S.C. § 4321 (1976); DOT 5610.1C, DOT Motion, Ex. C, pts. 2(a)(1), 2(b), 3(a). Third, adequate assessment of low-probability/high-consequence risks is legally necessary for DOT rationally to make the finding, required by NEPA if no environmental impact statement is to be prepared, that its proposed course of action will have no significant impact on the human environment. 42 U.S.C. § 4332(2)(C) (1976). Because DOT's assessment of low-probability/high-consequence risks was inadequate in each of these three respects, its Final Rule is invalid as applied in circumstances where those inadequacies are shown to be controlling.

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The regulations promulgated by the Council on Environmental Quality, and adopted in their entirety in DOT Order 5610.1C, set forth the decisionmaking procedures mandated by NEPA. As early in an agency decision process as possible, DOT must (1) adopt a systematic, interdisciplinary approach that will use the natural and social sciences to evaluate the impacts of its proposed course of action on the human environment, 40 C.F.R. § 1501.2(a) (1981); (2) identify environmental effects and values in sufficient detail that they may be compared to economic and technical analysis, *id.* § 1501.2(b); (3) study, develop, and describe alternatives that promise to mitigate adverse environmental consequences of the principal proposal, *id.* § 1501.2(c), see *Trinity Episcopal School Corp. v. Romney*, *supra*, 523 F.2d at 94. The agency must also determine whether, under 42 U.S.C. § 4332(2)(C), it is required to prepare an EIS. To that end, unless an EIS is obviously required or the proposal is a "categorical exclusion" not subject to the requirement, *id.* § 1501.4(a), the agency must prepare an "environmental assessment" on which to base "its determination whether to prepare an environmental impact statement." *Id.* § 1501.4(b), (c). The assessment must "include brief discussions of the need for the proposal, of alternatives . . . , [and] of the environmental impacts of the proposed action and alternatives." *Id.* § 1508.9 (3)(b). That discussion must enable the agency to perform the two enumerated functions of the environmental assessment: to "provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact"; and to "[a]id an agency's compliance with [NEPA]" when an EIS is unnecessary. *Id.* § 1508.9(1), (2).

The agency's responsibility to comply with NEPA is defined in terms of the goals and policies of the Act. The

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purposes of NEPA include promoting "efforts which will prevent or eliminate damage to the environment and the biosphere and stimulate the health and welfare of man." 42 U.S.C. § 4321 (1976). Toward that end, the Act directs agencies to "use all practicable means, consistent with other essential considerations of national policy," to "attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences." *Id.* § 4331(b)(3). The DOT regulations require that, "to the fullest extent practicable" and without impairing other national policies, federal agencies "restore or enhance environmental quality" and "avoid or minimize adverse effects wherever possible." DOT 5610.1C, pt. 2(a). Adequate assessment of credible risks of catastrophe, however slight their probability, is crucial to compliance with these goals. NEPA requires adequate assesment of risks as a procedural means to this end. 42 U.S.C. § 4332(2)(A), (B), (C), and (E). CEQ and DOT regulations make the responsibility more explicit. *E.g.*, 40 C.F.R. §§ 1500.2(b), 1501.2(a) and (b), 1506.5(b), 1507.2 (1981); DOT 56101C, pts. 2(c), 3(a), 4(d). Whether the agency has adequately assessed environmental impact for these purposes is judged in the courts by "the rule of reason." *Natural Resources Defense Council, Inc. v. Morton*, 458 F.2d 827, 834 (D.C.Cir.1972); *Hanly v. Kleindienst*, *supra*, 471 F.2d at 830.

The most important determination made on the basis of the environmental assessment is whether the proposed action is one "significantly affecting the quality of the human environment," thus requiring preparation of an EIS. 42 U.S.C. § 4332(2)(C) (1976). CEQ regulations define "affecting," for purposes of NEPA, as "will or may have an effect on." 40 C.F.R. § 1508.3 (1981). "Significantly," say the CEQ regulations, must be defined in terms of "context" and "intensity" of potential impact. *Id.* § 1508.27.

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The CEQ regulations are not of themselves binding on other agencies, but are entitled to "substantial deference" as interpretations of the statute. *Andrus v. Sierra Club*, 442 U.S. 347, 356-61, 99 S.Ct. 2335, 2340-42, 60 L.Ed. 2d 943 (1979). Moreover, in DOT's case they have binding force because DOT has adopted them. DOT Order 5610.1C, pt. 1. In addition, DOT has adopted regulations supplementing the CEQ regulations, and committing DOT to the same procedures. See DOT 5610.1C, pts. 2, 3(a), 4(a), 4(d), and 5.

"[T]he applicable scope of review of an agency's threshold determination that an impact statement is not required . . . is the arbitrary, capricious, and abuse of discretion' standard." *Hanly v. Kleindienst*, *supra*, 471 F.2d at 30. The Court must examine the administrative record to determine whether "the agency has supplied convincing reasons why potential impacts are truly insignificant." *Maryland-National Capital Park & Planning Comm'n v. U. S. Postal Service*, 487 F.2d 1029, 1040 (D.C.Cir. 1973). Judge Leventhal detailed criteria relevant to that judgment:

First, did the agency take a "hard look" at the problem, as opposed to bald conclusions, unaided by preliminary investigation? . . . Second, did the agency identify the relevant areas of environmental concern? . . . Third, as to problems studied and identified, does the agency make a convincing case that the impact is insignificant?

Id. (footnotes omitted); see *Cross-Sound Ferry Services, Inc. v. United States*, 573 F.2d 725, 731 (2d Cir. 1978); *Hanly v. Kleindienst*, *supra*, 471 F.2d at 830-31. Fundamentally, "[t]he agency must articulate a "rational con-

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nection between the facts found and the choice [here the finding of no significant impact made].”” *Cross-Sound Ferry Services, Inc. v. United States*, *supra*, 573 F.2d at 730 (quoting *Bowman Transportation, Inc. v. Arkansas-Best Freight System, Inc.*, 419 U.S. 281, 285-86, 95 S.Ct. 438, 441-42, 42 L.Ed. 447 (1974)).

Assessment of whether a low-probability/high-consequence risk is one significantly affecting the human environment must begin with an analysis of two factors. The first necessary step is to marshal the available evidence relevant to estimating the probability that the accidents at issue can be expected to occur. The second step is to perform the same inquiry with respect to estimates of the expected consequences. Estimates of probability or consequences are no more reliable than the facts and assumptions on which they are based. The agency is not required by NEPA to establish risk to any particular degree of certainty. But it must, in performing the evaluation, form and state in some discernible manner its views of the reliability of data and assumptions underlying risk and consequence estimates, at least where reasonable doubts have been raised about them. DOT has recognized the need separately to evaluate the risks and consequences of credible worst-case events, and several important decisions confirm these obligations. *Eg. Ethyl Corp. v. EPA*, 541 F.2d 1 (D.C.Cir.) (en banc), *cert. denied*, 426 U.S. 941, 96 S.Ct. 2663, 49 L.Ed.2d 394 (1976); *Carolina Environmental Study Group v. United States*, 510 F.2d 796, 799 (D.C.Cir. 1975).

A third step is also essential. The agency must address itself to “the relation between the risk [i.e., profitability] and harm presented by each case.” *Ethyl Corp. v. EPA*, *supra*, 541 F.2d at 18. In other words, the agency has

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"the burden of performing and clearly explaining [its] risk calculations." Yellin, *Judicial Review and Nuclear Power: Assessing the Risks of Environmental Catastrophe*, 45 Geo.Wash.L.Rev. 969, 977 (1977). This step flows necessarily from the agency's responsibility to support its judgment about the significance of the impact, and from its ultimate duty under HMTA to decide whether potential gains from its proposal justify imposing the risk. Significance depends on estimation of the credible consequences discounted by their improbability. In some circumstances, significance will depend heavily on the gravity of the potential consequences, for some consequences are so grave that, however unlikely, their mere "credibility" makes the impact of an agency action significant. Ultimately, the analysis must establish a rational basis for the agency's conclusion about the significance of the impact of its action on the environment.

1. DOT's Estimation of Probability

The CEQ regulations adopted by DOT provide that an agency evaluating the "significance" of a proposed action must determine "[t]he degree to which the proposed action effects public health or safety," and "[t]he degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks." 40 C.F.R. § 1508.27(b)(2) & (b)(5) (1981). DOT found that the probability of highway accidents severe enough to cause large consequences was "credible" but very small. Only a minute proportion of all radioactive shipments (much less than 1%) could conceivably cause such an accident; in particular, shipments of irradiated (spent) fuel, and other large-quantity radioactive materials, in-

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cluding Co-60 (cobalt), Po-210 (polonium) and Pu (plutonium). NUREG-0170 and SANDIA support this view, which is uncontroverted in this litigation. *See NUREG-0170* at 5-38, 5-56 (Table 5-12); *SANDIA* at 53 (Table 3-5), 55, 68, 129-31.

The NRC staff interpreted NUREG-0170 as estimating the probability of the most severe form of a high-consequence accident as no more than 3×10^9 per year for 1975 shipping rates. It found that the occurrence of such an accident would require all the following conditions: (1) one of the twenty or so annual shipments of plutonium or polonium would have to become involved in an extremely severe accident; (2) the security of the package would have to be comprised; (3) a "significant fraction" of the plutonium or polonium would have to escape the vehicle and become airborne; and (4) meteorological conditions would have to permit sufficient dispersal of the materials for large numbers of people to breathe air containing the materials in high concentrations. NUREG-0170 at v-vi. SANDIA draws similar conclusions about accident probabilities, which it estimates to range from 2×10 plus minus¹¹ for a release of spent fuel to 8×10 plus minus¹⁴ or exposure of a Co-60 shipment; it gives an overall figure of 3×10 plus minus⁹ for the most severe accident for material transported in Type A or LSA packages. SANDIA at 66 (Table 3-11, note b).

Plaintiffs vaguely criticize the statistical methodology used in NUREG-0170 and SANDIA, but they offer no substitute. The basic methodology is reasonable. The probability estimates must, however, be properly understood. These figures estimate the probability that a severe accident, termed a "Category VIII occurrence," will occur in any given shipment, within a single cell (1 km²) of

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travel. The number is derived "by multiplying the accident rate (No. of accidents/km of travel) times the distance traveled in the cell (km) times the fraction of all accidents occurring in a densely populated urban area that result in the maximum release." *Id.* A process of this nature is bound to result in a very low number, because each factor greatly reduces the estimated likelihood of the event. The accuracy of the underlying numbers, therefore, becomes a matter of great significance, with small changes potentially affecting the statistical estimates by orders of magnitude. Moreover, the estimates are of the likelihood per shipment of the very worst possible accident occurring in any kilometer of travel. These numbers are useful and informative, but they do not estimate the probability with which society is directly concerned: the likelihood of any catastrophic accident, of the greatest or of some lesser magnitude, in any of several hundred shipments, in any of the several thousands of square-kilometer cells of travel in densely populated areas throughout the United States. "[T]he significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality." 40 C.F.R. § 1508.27(a) (1981).

DOT's conclusion that high-consequence accidents are very unlikely is supported by the record. But the agency's description of certain categories of such accidents as having the likelihood of occurring once in several billion years, for example, is crude and simplistic. An agency's attempt to express the probability of a risk in ordinary language is hardly a fault; it is commendable, and DOT's statement is appropriate insofar as it conveys the message that the probability of a grave accident is extremely low. Nevertheless, DOT's chosen language for expressing the prob-

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ability estimate may mislead because it fails to alert the reader to the underlying methodology and its limitations as a description of the probability of a severe accident that society as a whole faces as a result of the activity. In this case, for example, DOT has indicated its awareness of the weaknesses in the data and methodology employed, *id.* at 33,⁷ and concluded that despite its characterization the worst-case scenario is a "credible" circumstance, 46 Fed. Reg. 5299 (1981).

That DOT recognizes and treats the worst-case scenario as "credible" is significant. Courts have recognized that "[t]here is a point at which the probability of an occurrence may be so low as to render it almost totally unworthy

⁷The Assessment states:

It is recognized that the data and methodology employed by these studies are not foolproof and have, in fact, been the subject of criticism. For instance, the 1975 shipper survey, the basis for the standard shipment model and therefore crucial in deriving risk estimates, was subject to some uncertainty. However, even if one accepts that the risks are underestimated by an order-of-magnitude (it should also be mentioned that many believe the risks to be grossly overestimated), the projected overall risks from the transportation of radioactive materials would still be very low. Furthermore, one cannot ignore historical accident experience which is shown to be quite good for radioactive material transportation when compared to other hazardous material classes (as recorded by MTB's incident reporting system, 1971-1980). Although historical experience by itself may not necessarily be the best method of projecting future events, the low historical accident rates do tend to support the research conclusions that the risks in transporting radioactive material by highway are very low.

Environmental Assessment, DOT Motion, Ex. D at 33.

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of consideration." *Carolina Environmental Study Group v. United States*, *supra*, 510 F.2d at 799. The issue in *Carolina Environmental Study Group* was whether the Atomic Energy Commission had adequately examined the public risks of catastrophic nuclear accidents before licensing the construction of nuclear power plants. The administrative finding of no credible risk in that case has been criticized. *See, e.g., Yellin, supra*, 45 Geo.Wash.L. Rev. at 979-81. The principle stated in the case is valid, however, *see Hanly v. Kleindienst, supra*, 471 F.2d at 836-40 (Friendly, J., dissenting), so long as it is applied with an awareness of uncertainties inherent in statistical probability assessments, and of their tendency to result in very low numbers expressed in terms requiring intelligent appraisal. DOT's conclusion, therefore, recognizes that the probability estimates here must be treated as posing a real, albeit small risk, which is therefore worthy of consideration in the environmental assessment and regulatory planning processes. Indeed, DOT considered the probability of such accidents sufficiently substantial to order that carriers of large-quantity shipments use circumferential highways around cities even though SANDIA and the NRC "Environmental Impact Appraisal for HM-164" demonstrated that normal dosage levels and the risk of accident fatalities where the cask was not breached would be significantly higher on the circumferential route. *See Environmental Assessment*, DOT Motion, Ex. D at 13, 20, 29-30. This was done to "further reduce the already small, but important, possibility of a catastrophic urban transportation accident." *Id.* at 19.

The record strongly supports DOT's conservative treatment of the high-consequence accident as credible. The methodology used by NUREG-0170 in categorizing acci-

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dents by severity was designed to identify and to designate as Category VIII accidents events that could occur as the result of the combined effects of crush force, fire, and puncture. *See generally* NUREG-0170 at 5-1 to 5-16 (explaining methodology for classifying aircraft and truck accidents). SANDIA accepts this methodology and concludes, as does NUREG-0170, that the high-consequence accident, though unlikely, is a sufficiently real possibility to warrant separate consideration and analysis. SANDIA at 41-42, 64-65; NUREG-0170 at 5-38.

Plaintiffs contend that, despite DOT's recognition that the high-consequence accident is a real and plausible risk, the agency has failed in its NEPA duty to develop and consider evidence that would dramatically raise its estimated probability. In particular plaintiff's assert that DOT has underestimated the number of large-quantity shipments that can be expected to traverse New York City by 1985 and into the future. DOT's assessment of risk must take into account both facts as they exist today and "the long-range character of environmental problems." 42 U.S.C. § 4332(2)(F). *See also* 40 C.F.R. § 1508.27(a) (1981) ("Both short-and long-term effects are relevant"). NUREG-0170 and SANDIA base their analyses on large-quantity-shipment data from 1975, which report 254 highway shipments of spent fuel in casks and about 200 additional shipments in large-quantity packaging. NUREG-0170 at A-11 (Table A-4). The study from which NUREG-0170 takes its data projects that in 1985 there will be 1530 spent fuel shipments by highway, and about 400 other shipments in large-quantity packages. *Id.* at A-21 to A-22 (Table A-8). DOT accepts and relies on the data from NUREG-0710, but all several points it relies as well on data from the IRG Report, sum-

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marized by DOT as projecting "that 260 truck shipments and 260 rail shipments will be made in 1985 . . . (p. D-30), compared to 1530 truck and 652 rail shipments . . . which NUREG-0170 projects (pp. A-13, A-22)." Environmental Assessment, DOT Motion, Ex. D at 6; *see id.*, app. 1A. DOT then calculates that the IRG's reduced spent fuel transportation estimates would reduce the NUREG-0170 estimate for total large-quantity shipments in 1985 from 1,911 to 641. It also points out that the number will be further reduced to 600, if it is "assumed that no recycled plutonium shipments are made in 1985." *Id.* at 6-7. Although the Environmental Assessment states that it will use NUREG-0170 figures, it qualifies that statement by adding "where differences are minimal," *id.* at 7, and it introduces its discussion of the subject by stating that the IRG Report was "used to modify NUREG-1070 figures concerning 1985 shipments of spent fuel," *id.* at 6. In fact, the Assessment repeatedly refers to both sets of data, thereby at minimum suggesting that the IRG data should be considered as significantly qualifying the probabilities and therefore the public risk of future spent-fuel transport. *See id.* at 17, 19, 23, app. 3 at 2, app. 4, app. 5, app. 9 at 4. At one point, the Assessment uses the IRG data implicitly to refute plaintiffs' claim of increased shipments through New York City. Whereas the NUREG-0170 data projects 72 truck shipments of spent fuel through the City in 1985 (up from 12 in 1975), DOT states that "[the] more conservative IRG Report estimate would leave the spent fuel shipments in 1985 in New York City unchanged from 1975." *Id.* at 19.

Plaintiffs' position on this issue differs very little from the estimate in NUREG-0170. They assert that by 1983 the Shoreham Nuclear plant will, if operating, "produce approximately 35 to 70 truckloads of nuclear reactor spent

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fuel as well as low level radioactive waste"; they also assert that about 20 truckloads of spent fuel can be expected from BNL and still more shipments might come from two atomic power reactors now being planned but now "indefinitely delayed." Solon Affidavit, ¶¶6-7, City Motion. But DOT's analysis is seriously flawed, because its reference to and reliance on the alleged IRG projections appear to be a clear interpretive error.⁸ DOT's failure to deal adequately with the issue of the projected number of spent fuel and other large quantity shipments is also evident in its apparent unwillingness to acknowledge the great uncertainties that exist on this subject and the possibility that the number of such shipments will increase exponentially, thereby dramatically affecting the proba-

⁸ The assessment refers to page D-30 of the IRG Report to support its reliance on the drastically reduced 1985 projections. That page in the IRG Report contains a table entitled "Domestic Spent Fuel Transportation." When read in conjunction with the preceding page, D-29, it seems clear that the two "Cases" posed in the table are hypothetical models intended to project the need for and capacity of spent fuel casks. The table appears to demonstrate that, if in 1985 only 7 casks are available for truck transport of commercial fuel to government facilities, and if each cask has an annual capability of 39 shipments, then truck shipments in 1985 would be limited to about 260. That the demonstration is purely hypothetical is reflected by the observation at page D-29 of the Report that "[t]here are 9 truck casks . . . available for use today [i.e., 1978]." In fact, a statement at the same page notes that a table other than that relied on by DOT poses hypothetical cases of 1985 estimates of government shipments of high level waste of 1,590 and 2,530 shipments respectively; the Report then adds: "Both of these results are comparable to the industry spent fuel shipments required under each case." IRG Report at D-29.

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bility estimates of a major accident.⁹ In addition, DOT has not referred to a highly relevant observation in SANDIA, to the effect that estimating the future number of large-quantity shipments was a task too uncertain to undertake "with any degree of accuracy" for New York City. SANDIA at 24. The SANDIA Report in fact relies

⁹ DOT failed to mention data on spent fuel and plutonium shipments collected in a report prepared for the NRC in 1978, and published by that agency in 1980. That report refers to estimates made by the Environmental Protection Agency (EPA) in a 1974 report on both spent fuel and plutonium shipments with projections through the year 2020. The number of spent fuel shipments (both truck and rail) are estimated to increase to 2,103 by 1985, to 7,513 by 2000, and to 15,043 by 2020. Plutonium shipments (50% by truck) are estimated to increase from 60 in 1975, to 400 by 1985, 4764 by 2000, and 20,737 by 2020. NUREG/CR-0742: *Review and Integration of Existing Literature Concerning Potential Social Impacts of Transportation of Radioactive Materials in Urban Areas* 71 (Exhibit II-4). The authors wrote:

Although the average number of miles per shipment are presumed to decrease as new facilities are built around the country, the number of shipments per year is estimated to increase so rapidly that total units-times-miles figurers increase over the 45 year period by a factor of 18 for spent fuel and 138 for plutonium. Consideration of the number-of-shipments columns might well give one pause since each shipment provides an opportunity for an accident or a diversion, in addition to possible public response to "normal" transport. The estimated increase from 363 spent fuel shipments in 1975 to over 2,000 by 1985 might be enough cause for concern, but the estimated increase from 60 plutonium shipments to 400 in the same period is potentially much more serious.

Id. at 70. Of course, these data might be unreliable, but DOT did not analyze the question.

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exclusively on 1975 data, leaving uncertain the potential effects of increased shipments on its probability analysis. As stated above, DOT may use reports of other agencies in evaluating the risks of its proposed course of action, but NEPA requires it to evaluate those reports independently and to draw rational conclusions from them. 40 C.F.R. §§ 1506.5(b), 1507.2. Even the judgment that no accurate predictions are possible would have a material bearing on the use DOT makes of its probability estimate. *See* 42 U.S.C. § 4332(2)(B); 40 C.F.R. § 1507.2(b).

A further problem with DOT's analysis of the probability issue is its reliance on accident reports filed with the agency. *See* 45 Fed.Reg. 7140 (1980) ("The information available to DOT through the Department's Hazardous Materials Incident Reporting System . . . indicates that radioactive materials transportation has a good safety record.") *See also* 46 Fed.Reg. 5298; 5299, 5315 (1981). In its Environmental Assessment, in fact, DOT relies on historical accident experience to buttress its fairly uncertain probability predictions. The agency has conceded elsewhere, however, that its accident data system is unreliable:

Although the DOT does not know the exact number of companies subject to this requirement, agency officials concede that those reporting constitute only a small percentage of them. Furthermore, the DOT concedes that the information transmitted by these reports is not reliable. The DOT Hazardous Materials Transportation Task Force noted that "the adequacy and relevancy of much of the data [in the incident reports] are questionable" and "the credibility of available incident data is questionable, and there is no routine validation of the data [by the DOT.]"

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DOT Task Force Report, cited in National Transportation Safety Board, Safety Effectiveness Evaluation (NT SB-SEE-81-2), City Motion, Ex. Q at 5 (footnotes omitted). On reconsideration of this subject, DOT should address itself to whether these data are in fact worthy of significant weight in light of its own view of their reliability.¹⁰

Another source of uncertainty in DOT's probability estimate is that the agency's conclusion that cask and Type B packaging "would be expected to survive [a severe transportation accident] without any significant release of its contents" is of questionable accuracy. 45 Fed.Reg. 7143, col. 2 (1980). The conclusion is not, as the State asserts, on its face arbitrary or capricious, because it is supported

¹⁰ New York State has moved to discover a variety of documents from DOT relating to the hazards of and alternatives to highway transportation. Because this opinion disposes of the litigation by summary judgment, the State's motion need not be decided. But insofar as review of DOT's regulation is limited to the administrative record, the State's motion is meritless; with respect to the NEPA claim, through material outside the administrative record may be considered, *County of Suffolk v. Secretary of the Interior*, 562 F.2d 1368, 1384-85 (2d Cir. 1977), *cert. denied*, 434 U.S. 1064, 98 S.Ct. 1238, 55 L.Ed.2d 764 (1978), the State should not be permitted to use discovery in an obstructive manner to obtain documents that it did not attempt to obtain in the rulemaking proceeding. DOT should on reconsideration, however, provide the State of New York and any other parties sufficient access to the data DOT has collected to meet the State's allegation that DOT has suppressed information and incidents to make the data appear to support the view that highway transport is safe. Memo. of Law by State of New York in Opposition to Motion for Summary Judgment at 21-24, and related interrogatories and affidavits. See 42 U.S.C. § 4332(2)(G) (1976); 40 C.F.R. §§ 1501.2(d)(2), 1506.2(b) and (c) (1981).

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by NUREG-0170 and SANDIA. See also IRG Report at 111-12. But substantial arguments have been made that might reasonably cause DOT to temper its judgment of cask reliability. See, e.g., *A Scoping Study of Spent Fuel Cask Transportation Accidents* (NUREG/CR-0811) (1979); *An Assessment of the Risk of Transporting Spent Nuclear Fuel by Truck* (PNL-2588) (1973).¹¹ These matters may have been considered by DOT before reaching its conclusion. If so, however, DOT's consideration is not reflected in the record. The matter is important enough that the agency must address the conflicting evidence.

DOT's probability estimates also fail to take into account the potential effect of human error. Accident data of course incorporate a significant amount of the relevant human error. But human error pervades the process of radioactive-waste transport; it is of particular signifi-

¹¹ NUREG-0170 recognizes that the "paucity of data on package responses to severe accidents" makes the consequences of such accidents difficult to predict. Accidents became increasingly catastrophic as greater quantities of radioactive materials are released from their containers. Several different types of containers are used in carrying radioactive materials: drums, Type A, Type B (plutonium and nonplutonium), and casks. Containers can withstand accident forces of far greater magnitude than they are required to withstand. NUREG-0170 computes "release fractions" for all types of containers based on both their minimum and their practical ability to withstand accidents of each category of severity. In particular, the large casks used for large-quantity shipments are assumed to be able to withstand any accident up to Category V. A Category VI accident is considered the minimum with forces sufficient to cause a crack through the entire cask. A Category VII accident is assumed to cause a crack 1 cm. wide; a Category VIII accident is assumed to caused a crack 10 cms. in width. NUREG-0170 at 5-24.

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cance in the preparation and loading of spent-fuel casks and large-quantity packaging. NUREG-0170 gives no weight to this element in its analysis. SANDI devotes an entire chapter to the subject of human error and deviation from quality assurance practices; it also notes several reported incidents of human error that are pertinent to the risk assessment. SANDI performs a separate analysis of the potential costs of such errors and concludes that the expected costs are small. The report recognizes, however, that the data sources on which it relies are "vastly different." Furthermore, errors in package handling and management would appear capable of combining with accidents to cause a significant increase in the expected incidence of high-consequence occurrences. A failure properly to secure a cask, for example, could enable an accident of lesser severity than a Category VIII incident to cause a release of radioactive material equivalent to one normally expected only in the most severe accident. Accidents with severity ratings below Category VIII are far more likely to occur than accidents in that most severe category. Thus, even though very few casks will be used in a condition of lessened effectiveness, those casks may, because of human error, be much more likely than usual to become involved in an accident of sufficient severity to cause a disaster of the sort normally expected only in Category VIII situations. SANDIA recognizes the possibility of such synergistic consequences, but it does not analyze the possible effects of this observation on its probability estimates. SANDIA at 34 ("Although there are possible synergisms that would connect the human error with a vehicular accident, the two were considered spearable for this treatment."). NEPA does not require DOT to engage in technical, mathematical analysis of each element in a probability evaluation; but it does require the agency to study,

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discuss, and take into account matters that may affect any statistical estimates that the agency itself advances as reliable. Human error and its possible synergisms constitute such an element.

The most serious deficiency in DOT's probability assessment is its failure to explain the effect of possible sabotage, terrorism, and other acts of human perversity. DOT did address the subject of sabotage and has taken reasonable steps to reduce the dangers, including an extension of NRC security requirements to many more large-quantity shipments. 46 Fed.Reg. 5312-13 (1981); 45 Fed.Reg. 7150 (1980). DOT's decision to await NRC's evaluation of the need for physical protection of large source isotopes is also reasonable in light of NRC's prime responsibility for nuclear cargo security. But the relevance of malevolent acts to DOT's probability assumption is a separate subject, because it bears on the confidence with which DOT may reasonably rely on probability estimates based solely on accident data in evaluating the likelihood of a high-consequence occurrence.

DOT's conclusions on the subject are, as on most other issues, improperly scattered in several documents, without any overall summary that refers to discussions by subject. In the proposed rulemaking DOT noted that "spent fuel casks could become the target of terrorist activity although the likelihood of a successful act of sabotage that breaches a spent fuel cask and disperses its contents *may be quite small.*" 45 Fed.Reg. 7150 (1980) (emphasis added). It concluded that no special requirements were necessary for shipments of small source nonfissile isotopes, since they were such unlikely subjects of sabotage attack and could cause only limited consequences. With respect to shipments of large-source nonfissile isotopes, DOT said only

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that it would await NRC's judgment on the need for additional protection. *Id.* The Final Rule and Summary of Comments take the position that NRC practices should govern security; they fail to comment in any detail on the likelihood of successful sabotage events. In rejecting the suggestion that spent fuel shipments be banned from densely populated areas as a precaution against sabotage, DOT responded "that even the NRC has never considered this risk to be so extreme as to require the imposition of an absolute ban from any heavily populated urban areas. . . . Achieving risk levels which are considered acceptable for these materials is assured through use of circumferential highways, a reinforced escort detail, nonstop transit and the like." Summary of Comments, DOT Motion, Ex. E, pt. E at 6.

NUREG-0170 supports the proposition that sabotage is not a significant problem in nuclear materials transport. The report definitively concludes that the shielding used in transporting irradiated (spent) fuel amply protects it from sabotage. "A massive rupture of the containers by mechanical means or high explosives . . . is considered to be essentially impossible." NUREG-0170 at 7-2. Furthermore, though a container could possibly be breached by explosives, causing dispersal of the gaseous inventory and a small portion of the solids, "the effects [of such an incident] in a population density of 2000 people per square mile are calculated to be about 1 early death and about 220 latent cancer fatalities." *Id.* In sum, "[s]pent fuel in transit is considered to be neither an attractive nor a practical target for theft or sabotage." The only other category of shipments posing any conceivably significant risk due to sabotage is that of large-quantity shipments of radioisotopes (10 to 10^6 curies). These ma-

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terials must be shipped in Type B containers or large-quantity packages, which "make theft a difficult endeavor and disposal of the contents an impractical event." *Id.* at 7-4. A sufficient amount of explosives could, the report recognizes, breach container integrity and cause radioisotopes to be dispersed to the atmosphere or ground. NUREG-0170 projects that the effects of such an accident, in the worst-case scenario, would be the same as those of a Category VIII accident in a high density area. A Cobalt-60 accident would cause no latent cancer fatalities; a Polonium-210 accident, however, would be expected to cause 117 latent cancer fatalities and substantial economic damage (\$300,000,000). *Id.* at 5-46 to 5-48 (Tables 5-12 and 5-14). Despite these consequences, however, the report concludes that, because of "the protection afforded by the shipping container and the high level of radioactivity of the contents, . . . [t]he consequences associated with worst-case acts of sabotage would not constitute a significant radiological hazard." *Id.* at 7-4.

The SANDIA report reaches very different conclusions. Recognizing the public concern generated by the worldwide increase in terrorist activity, SANDIA concludes that, "although there appear to be no documented incidents of sabotage to nuclear materials in transit, the question must be addressed." SANDIA at 85. Most significantly, the report goes on: "Sabotage involves human motivations and the probability of human actions which are unquantifiable with our present knowledge." *Id.* Furthermore, the report does not address the effects of the NRC security requirements "primarily because treating such a situation from a risk viewpoint would require knowledge (or an estimate) of the probability of an adversary attack against spent fuel and knowledge of ad-

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versary capabilities. This information is not available and any such estimates would have considerable uncertainty." *Id.* The Nuclear Regulatory Commission echoed this judgment when it stated that "estimates of the probability of successful sabotage of spent fuel shipments cannot be made with any confidence." 45 Fed.Reg. 37402 col. 3 (1980). Consequently, SANDIA concludes by analyzing the sabotage problem on the assumption "that a sabotage attempt is made and that it is successful . . . , [and] that the intent of the adversary is to inflict public harm (both radiologic and economic) either by dispersal of radioactive material or direct radiation exposure." *Id.* The report therefore entirely discounts the NRC safeguards, and concentrates on how an incident could occur, and what consequences would result. At minimum, this mode of analysis reflects a judgment that the likelihood of a serious act of sabotage is widely perceived as sufficiently real, and that this perception cannot reliably be refuted.

SANDIA views a sabotage event as technically feasible. The report describes the difficulties a saboteur would face in attempting to breach a spent-fuel or Type B large-quantity container. Mechanical opening would be unlikely. But explosives are available to enable a group to breach either type of package, most feasibly by airblast, by breaching charge, or, with some technical know-how, by a shaped charge. The most plausible scenarios require coordination, time-delay fuses, and vehicular and weapons support. But the report makes it evident that a capable and well-supported group could hijack a shipment, drive it to a selected point to maximize harm and feasibility, and then detonate the explosive selected. (Attacks on rail casks would be less feasible.) *Id.* at 86-95. Although the report makes clear that additional protection is provided by NRC meas-

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ures, *id.* at 132, the tone and content is in marked contrast to the firm declarations of infeasibility in NUREG-0170.

DOT could properly leave to NRC the leading role in planning security measures for spent fuel and other shipments potentially attractive to saboteurs. But, given the conflicts in the underlying data, it was obligated to state its view on the probabilities of such an event, even if that view was only that no estimate could reasonably be made. The agency was free to conclude, moreover, that the likelihood of sabotage is unlike that of accidents, because the latter are inevitable (*i.e.*, statistically predictable) whereas the former can no more be said to be inevitable than they can be said to be unlikely. Nevertheless, the very unpredictability of malevolent acts is a matter of great relevance to planning. For the uncertain possibility of such acts can only weaken the confidence one might reasonably place in a low-probability prediction of a high-consequence occurrence based only on accident data. DOT must show that it is aware of this additional uncertainty in its estimation of probability and thereafter of overall public risk and environmental impact. See 40 C.F.R. § 1508.27(b)(5) (1981). As in *Natural Resources Defense Council, Inc. v. Nuclear Regulatory Comm'n*, 539 F.2d 824, 842 (2d Cir. 1976), *vacated and remanded on other grounds*, 434 U.S. 1030, 98 S.Ct. 759, 54 L.Ed.2d 777 (1978), DOT's its [sic] failure to address the special problems of "theft, diversion or sabotage" violates NEPA.

In conclusion, DOT's probability estimates are misleading in their expression, and several of the sources for those estimates indicate that the probability of a high-consequence accident may be much more likely than DOT apparently assumed. DOT must address itself to these criti-

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cal weaknesses. In addition, DOT has failed adequately to consider the possible impact of human error and sabotage on its probability estimates. DOT must demonstrate that it has considered these elements of potential materiality to the probability of high-consequence events. And it must lay the basis for planning into the future by gauging to the extent reasonable the numbers of shipments to expect as a result of its decisions.

2. DOT's Evaluation of Consequences

The second step required in analyzing the problem of low-probability/high-consequence accidents is to evaluate the potential consequences of such events. DOT summarized the risk of radiation, noting that it is not ordinarily detectable except by sophisticated instruments and that it can injure or kill humans through acute physiological change, carcinogenesis, or genetic effects. Furthermore, though other materials pose similar hazards, "the combination of these characteristics in the case of radioactive materials has produced a degree of public concern which has affected actions taken or being considered by State and local governments." 45 Fed.Reg. 7141 (1980). DOT considered both the physical and psychological consequences of major accidents. There is enough evidence on the physical consequences in the record as a whole to permit an intelligent assessment of the overall public risks of transporting spent fuel and other large-quantity radioactive materials. But DOT did not expressly resolve important and substantial variations in estimates present in the record. In addition, DOT developed an inadequate record on the social impacts of the hypothetically anticipated occurrences; more extensive consideration must be given this

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matter, irrespective of DOT's express view that the public's concern is unwarranted.

a. *Physical consequences.* DOT expressly referred to NUREG-0170's estimates of the consequences of two hypothetical accidents, both involving spent fuel, and both occurring in an urban area with 15,444 people per square kilometer. In one accident, DOT assumed that 100% of the gaseous and volatile materials were released as an aerosol and dispersed by winds. The health consequences were estimated to "be minimal with no early or latent cancer fatalities." The economic costs of clean-up, lost income, and living expenses "would amount to \$200 million." The second accident hypothesized would involve the release of "as little as 1% of the solids as an aerosol." This, DOT noted without further detail, "would have extremely serious consequences." 45 Fed.Reg. at 7143. In this connection, the Final Rule notes only that "DOT agrees that 'high consequence' accidents in densely populated urban areas should be of great concern." 46 Fed.Reg. 5315 (1981). The Environmental Assessment briefly states that an analysis of the worst-case scenario is contained in SANDIA, and that "[o]f particular concern is the projected economic costs of worst-case accidents involving spent fuel and Po-210—\$2 billion and \$9 billion respectively." Environmental Assessment, DOT Motion, Ex. D at 19-20. Even these minimal references demonstrate that DOT examined the projections in the two underlying reports. But given its responsibility independently to evaluate risks and draw rational conclusions, DOT should have expressed its view on the significance one might attach, in terms of the reliability of the projections, to the differences in NUREG-0170 and SANDIA.

In NUREG-0170, the following predictions are made with respect to certain category VIII accidents in high-density

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areas (15,444 pop./km²): spent fuel (economic cost \$400 million); Po-210 (117 latent cancer fatalities; 1 early morbidity; economic cost \$300 million); Plutonium (147 latent cancer fatalities, economic cost \$800 million). NUREG-0170 at 5-38 to 5-53. The projection in SANDIA differs significantly in some respects from NUREG-0170's for the same type of accidents although it relies on some different assumptions and refined population-density figures: spent fuel (1 latent cancer fatality; economic cost \$2 billion); Po-210 (10 latent cancer fatalities; 60 early morbidities, economic cost 9 billion); Plutonium (1800 latent cancer fatalities; 290 early morbidities; economic cost \$2 billion). SANDIA 66 (Table 3-11). The materials presented to the Court, moreover, contain letters discussing the findings of another study, *Calculations of Radiological Consequences from Sabotage of Shipping Casks for Spent Fuel and High-level Waste* (NUREG-0194) (Feb. 1977). That study concludes that the effects of sabotage with the largest credible solids-release fraction would be small, but the computational model uses a population density of 100 persons/mile² whereas the average population of New York City is 27,000 persons/mile², with areas as dense as 500,000 persons/mile². Dr. Solon scaled the results of NUREG-0194 linearly to obtain far higher potential consequences for a sabotage occurrence than had theretofore been predicted (zero to 10,000 early deaths and 200,000 to 1,300,000 latent cancer fatalities). A response by the study's authors criticizing. Dr. Solon's projection contains many valid points; but the data show that sabotage events can have consequences essentially as grave as the most serious accidents, and that great uncertainty exists as to the upper limits of the potential, albeit unlikely, catastrophe. City Motion, Exs. D, E, F. In sum, in over a period of about five years,

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estimates of the consequences of the most severe accident have escalated dramatically. DOT must address these uncertainties and their implications for rational planning. See 40 C.F.R. § 1508.2(b)(2), (b)(4), (b)(5), & (b)(8) (1981).

b. *Social consequences.* DOT noted that public anxiety exists over the possibility that radioactive-materials transport might have adverse effects, and that this anxiety is focused in particular on the potential consequences of a major accident. SANDIA in fact contains a summary of a study of the social impacts of radioactive materials transport. The study covers a variety of possible social impacts from the activity, including psychological, sociological, political, legal, and organizational. Economic impacts are excluded. It finds little impact from incident-free transport; local ordinances governing this subject have been passed, but they too might have been adopted because of the possibility of a severe accident. In fact, the study finds that public apprehension of a serious accident is substantial, and it predicts that an accident that results in death or in contamination of people or property in a densely populated area could produce substantial psychological impacts, greater than those resulting from a nonnuclear accident of equivalent magnitude. Such an accident could also disrupt social organization by causing suspension of business and social activities and even evacuation; and the effects would continue until the public became convinced that the long-term dangers had been controlled. See SANDIA at L-7. A major accident would also lead to increased political and legal activity, on a variety of levels, including on "broader nuclear energy issues." The predominant organizational impact predicted is that "[s]uch major accidents probably would indicate inadequacies in emergency

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preparedness at the city and state levels." *Id.* at L-9. Human error issues are also recognized as potentially a matter of public concern, especially after the recent incidents of serious errors at fixed facilities such as Three Mile Island. *Id.* at L-9 to L-10. The potential social consequences might be greater in the event of a malevolent act, including a loss of public faith in the safety of transporting nuclear materials, fear and possible panic, abandonment, and intense legal and political action thereafter. "Impacts would tend to be largest in urban, densely populated areas where the potential for harm is greatest." *Id.* at L-10. The report concludes that the public's concern over health effects and accidents is substantial despite the low probability of harm; that nuclear materials have the greatest potential for adverse social impact; and that the greatest adverse impacts are likely in urban areas, with malevolent acts having the greatest potential for causing these harms. *Id.* at L-12 to L-13. Other materials, including a study prepared for SANDIA, go into even greater depth on this issue, and predict even more serious potential consequences. *See generally Review and Integration of Existing Literature Concerning Potential Social Impacts of Transportation of Radioactive Materials in Urban Areas* (NUREG/CR-0742) (1980).

DOT's response to the evidence of public concern was to deem the concern unwarranted. The public, DOT stated, is incapable of rationally appraising the consequences of accidents: it tends to be disproportionately influenced by potentially large consequences. 45 Fed.Reg. 7141 (1980); *see p. 1245 supra*. Irrational public anxiety was responsible, in DOT's view, for the types of local laws and regulations that the agency divided in HM-164 tended to show local governments unfit to legislate in this area. At one

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point, the agency frankly expressed its view that, where it found public concern unjustified, it would refuse to regulate with a view to relieving such concern. Summary of Comments, DOT Motion, Ex. E, pt. H.4 at 4.

DOT is not free to disregard public concern, however unjustified it may be in the Department's view. The CEQ regulations DOT has adopted require explicitly that, in making its judgment about the significance of potential environmental effects, DOT consider "[t]he degree to which the effects on the quality of the human environment are likely to be highly controversial." 40 C.F.R. § 1508.27(b) (4) (1981). NEPA does not require DOT to give any particular weight to public concern. It does require, however, that DOT meaningfully consider evidence of possible social impacts, particularly of occurrences that DOT has determined are credible events, or are events the probability of which cannot be predicted reliably. *See* 40 C.F.R. § 1508.27 (b)(5) (1981) (agency must consider "[t]he degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks"). This duty is based on the fact that, irrespective of likelihood, the social impacts of radioactive materials transport are real, and hence must be evaluated.

Public reaction is a manifestation of collective wisdom based on human experience. It should not be lightly dismissed as unscientific. But even if public fear were based purely on faith (or the lack of it), fear has real consequences, which are costs that must be analyzed and included in determining whether the proposed action will have a significant impact on the environment. Public anxiety disrupts social and political priorities, diverting the attention of public officials and courts from other necessary activities. DOT's duty, therefore, goes beyond expressing

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its views on whether public concern is justified; the agency must examine the dimensions and expected costs of the concern, and must weigh those costs in determining the public risks of its proposed regulatory action, as well as in deciding whether an EIS is required.

3. DOT's Evaluation of Public Risk and Impact.

DOT was of course correct in stating that it is not required by NEPA to regulate to avoid all environmental consequences, however trivial. But, as DOT acknowledged, NEPA does require the agency to weigh all factors relevant to an evaluation of risk. 46 Fed.Reg. 5299-300 (1981). This is so because the agency must, on the basis of its environmental review, "use all practicable means, consistent with other essential considerations of national policy, . . . [to] attain the widest range of beneficial uses of the environment without degradation . . . [or] risk to health or safety." 42 U.S.C. § 4331(b)(3) (1976). Included in its calculus must be accurate information about the environmental impacts of the proposal. Moreover, the degree to which the proposal affects health and safety, the degree to which the harms are uncertain, unknown, or unique, and the degree to which the action is likely to be highly controversial, among other factors, must be considered when the agency evaluates whether its proposal is one significantly affecting the human environment. 40 C.F.R. § 1508.27 (1981).

The third step in rationally evaluating low-probability/high-consequence accidents is a meaningful assessment of the relation of the degree of risk and the magnitude of credible effects. As DOT recognized, in evaluating the significance of low-probability/high-consequence accidents

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the magnitude of the consequences must be separately assessed. 46 Fed.Reg. 5299-300 (1981). Although DOT suggested its adherence to this reasonable approach, it did little more than return for ultimate guidance to the "overall" likelihood of a severe accident. Each time the agency addressed the issue of impact, it referred to the overall accident data and reiterated that the likelihood of a severe accident was too low to warrant limiting highway transport of any form of radioactive waste, even in urban centers. The data relied on by DOT, as shown above, are in unresolved conflict on many crucial points in the analysis. Moreover, the flaws in DOT's analysis of probability and consequences render dubious any conclusions drawn from them. But most important, DOT's use of overall risk obfuscated the central question as to the environmental significance of its proposed action: whether a proposal entailing a credible risk of catastrophe demands treatment as one "significantly affecting the quality of the human environment."

Where risk is credible and uncertain, and the consequences grave, low probability is only one of several highly relevant factors that should be considered. Moreover, the *overall* accident rate is not even relevant at this point in the process of environmental analysis. The very purpose of what SANDIA calls "mini-max" analysis is to overcome the dangerously distorting effects on the significance of certain unlikely but grave events in statements of the overall effects or rates of accidents. The concept of "overall" accident risk as used in NUREG-0170 and SANDIA is merely the total annual radiological risk resulting from all shipments. NUREG-0170 at 5-1. This figure for each mode is in turn the product of the predicted probability of all accidents and consequences. As NUREG-0170 explains, "this method does not distinguish high probability—low

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consequence risks from low-probability/large-consequence risks." Certain shipments in densely populated areas could cause consequences more serious than any considered in the [overall] risk analysis. *Id.* at 5-33. SANDIA recognizes that, because extremely severe "accidents have very low probabilities of occurrence, they do not contribute significantly to the total expected values of risk." SANDIA at 68. Therefore, rather than using a measure of risk that merely quantifies the product of probability and consequence, SANDIA utilizes "mini-max" analysis, which permits "the calculation of the consequences of certain events separate from their probability, keeping in mind that at some point the consequences will be intolerably severe, even at an extremely low probability." *Id.* at 64. DOT also recognized that the potential effects of severe accidents are statistically obliterated by including them in a calculation with numerous other accidents of low consequence. Environmental Assessment, DOT Motion, Ex. D at 35. Its persistent reference to "overall" risk, therefore, merely carried the agency unproductively back to its starting point.

This failure to focus on the credible risk of disaster as itself a possible source of significance, particularly when coupled with DOT's failure to consider the possible impact of sabotage on its probability estimates and its exclusion of public concern from the factors bearing on "significance," renders DOT's finding of no significant impact arbitrary and capricious. Moreover, DOT apparently failed to consider another factor made explicitly germane to the inquiry into "significance" by the CEQ regulations adopted by DOT. 40 C.F.R. § 1508.27(b)(10) (1981) requires the agency, in evaluating intensity of impact, to inquire "[w]hether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment." The very catalyst of DOT's pro-

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posal was a local ordinance enacted to protect the environment. That local laws are to be set aside is a proper index of significance because, as Congress recognized in enacting NEPA, protection of the environment, and of the health and safety of citizens, is a matter of prime concern not only to our national government but also to local and state governments exercising traditional police powers. *See* 42 U.S.C. § 4331 (1976). Citizens of states and localities place their trust in their governments to pass laws to protect their well-being, and they expect that arrangements established to protect them at the local level will not be disturbed, absent well-considered national priorities to the contrary. Costs may be imposed as well by reducing the value of investments made in reliance on nonfederal laws. Those disrupted expectations and costs are germane to the significance of the impact of the federal actions that cause them.

Finally, DOT must consider the relevance, to its judgment about "significance," of other federal policies set by Congress or other federal agencies with responsibility in this area. NEPA requires agencies to consider the long-range aspects of environmental problems, *id.* § 4332(2) (F), and encourages the broadest participation of coordinate federal agencies in the development of environmental policy. *Id.* § 4331(b). Central among the policies that must be considered are the aims of MHTA, discussed below. In addition, although the nation has unquestionably committed itself to using nuclear power, and that policy requires the disposal of spent fuel in some manner at some time, DOT must consider the significance of the recommendation of IRG that, to the extent feasible, spent fuel should remain where it is generated, a policy that stems from the fact that the nation has yet to develop a definitive disposal policy. IRG Report at 101.

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In conclusion, DOT's finding of no significant impact has inadequate support, because too many germane factors were ignored, too many material disputes in the underlying data were left unanalyzed and unresolved, and too many pivotal conclusions are generalizations unsupported by the evidence. *See Cross-Sound Ferry Services, Inc. v. United States, supra*, 573 F.2d at 730-31. On this record, DOT's environmental assessment was inadequate, and its finding of no significant impact was arbitrary, capricious, and an abuse of discretion in the respects specified. 5 U.S.C. § 706(2)(A) (1976).

*B. DOT's Consideration of Alternatives**1. The Duty to Consider Appropriate Alternatives*

Whether or not DOT's finding of no significant impact was an abuse of discretion, NEPA required the Department to "study, develop, and describe appropriate alternatives" to its proposed action. The EIS contemplated in § 4332(2)(C) is only one part of the environmental protection procedure mandated by NEPA. In addition to requiring a description of alternatives where an EIS is necessary, NEPA separately commands that:

all agencies of the Federal Government shall . . . study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.

42 U.S.C. § 4332(2)(E). The courts unanimously hold that this duty "is not limited to a proposed major action significantly affecting the human environment, for otherwise it would add nothing to [§ 4332(2)(C)(iii)] which already

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imposed an obligation . . . to make with respect to a major action a statement of 'alternatives to the proposed action.'" *Aertsen v. Landrieu*, 637 F.2d 12, 20 (1st Cir. 1980). See, e.g., *Natural Resources Defense Council, Inc. v. Nuclear Regulatory Comm'n*, *supra*, 539 F.2d at 842; *Trinity Episcopal School Corp. v. Romney*, *supra*, 523 F.2d at 93; *Environmental Defense Fund, Inc. v. Corps of Engineers*, 492 F.2d 1123, 1135 (5th Cir. 1974); *Nucleus of Chi. Homeowners Ass'n v. Lynn*, 524 F.2d 225, 232 (7th Cir. 1975), *cert. den.*, 424 U.S. 967, 96 S.Ct. 1462, 47 L.Ed.2d 734 (1976); *Hanly v. Kleindienst*, 471 F.2d 823, 834-35 (2d Cir. 1972); *Sierra Club v. Alexander*, 484 F.Supp. 455, 468-69 (N.D.N.Y. 1980); *Monarch Chemical Works, Inc. v. Exxon*, 466 F.Supp. 639, 650-51 (D.Neb. 1979); *City of New Haven v. Chandler*, 446 F.Supp. 925, 933 (D.Conn. 1978); *State of Illinois ex rel Scott v. Butterfield*, 396 F.Supp. 632, 641 (N.D.Ill. 1975).

The reference in § 4332(2)(E) to proposals involving "unresolved conflicts concerning alternative uses of available resources," has been expansively construed. The duty to consider alternatives to such proposals is said to be "wider" than the scope of the duty to file an EIS. *National Resources Defense Council, Inc. v. Callaway*, 524 F.2d 79, 93 (2d Cir. 1975). The statutory language "might conceivably encompass an almost limitless range" of federal action. *Trinity Episcopal School Corp. v. Romney*, *supra*, 523 F.2d at 93. It extends not only to conflicting "public" uses, but to conflicts over public regulation of private uses. See *City of New Haven v. Chandler*, *supra*, 446 F.Supp. at 933-34 (duty applicable to Corps of Engineers licensing of private construction of electrical transmission towers); *Sierra Club v. Alexander*, *supra*, 484 F.Supp. at 469 (duty applies to Corps of Engineers permit for private

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construction of shopping mall). DOT's Final Rule is a proposal concerning alternative uses of public resources in numerous respects, since it has created conflicts over the use of many resources, including roads, bridges, tunnels, trucks, barges, and the capacity of the environment (including humans) to absorb the effects of the transport proposed.

A statutory duty expressed in vague terms is not made precise by expansive construction. In this instance, however, while the statutory language remains "opaque" as Judge Friendly found it some years ago, *City of New York v. United States*, 337 F.Supp. 150, 159 (E.D.N.Y. 1972) (three-judge court), taken together with its limited but somewhat informative legislative history, the NEPA regulations adopted by CEQ and DOT, and numerous judicial decisions, the statute provides ample guidance.

The Second Circuit has held that the duty to "study, develop, and describe" alternatives pursuant to § 4332 (2)(E) applies, at a minimum, when "the objective of a major federal [action] can be achieved in one of two or more ways that will have differing impacts on the environment." *Trinity Episcopal School Corp. v. Romney, supra*, 523 F.2d at 93. The minimal legislative history available supports this broad reading, in that NEPA's sponsors appear to have intended that agencies "know what options and alternatives are available" before they act in developing resources or managing the environment. 115 Cong. Rec. 3700 (1969) (Senator Jackson); see generally Jordan, *Alternatives Under NEPA: Toward An Accommodation*, 3 Ecol.L.Q. 705, 710-12 (1973).

CEQ regulations implementing NEPA require that agencies "[s]tudy, develop, and describe appropriate alterna-

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tives to recommended courses of action" "at the earliest possible time to insure that planning and decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts." 40 C.F.R. § 1501.2(d). They make clear that this duty extends to cases where an EIS is not necessary. *Id.* § 1507.2(d). CEQ's regulations purport to be binding on all federal agencies. *Id.* § 1500.3, 1507.1. But whether or not this is so where they are not expressly adopted by the agency, compare *Hiram Clarke Civic Club, Inc. v. Lynn*, 476 F.2d 421, 424 (5th Cir. 1973) (CEQ guideline not binding) with *Andrus v. Sierra Club*, *supra*, 443 U.S. at 358, 99 S.Ct. at 2341 (CEQ guidelines entitled to "substantial deference"), they are clearly binding in this situation because they have been adopted by DOT as its own, and supplemented to establish a general obligation to study, develop, and describe alternatives even when an EIS is not prepared.

In an Order entitled "Procedures for Considering Environmental Impact," DOT Order 5610.1C (Sept. 18, 1979), Exhibit C to DOT's Motion for Summary Judgment, the Department "implements the mandate of NEPA." *Id.* at 2. That Order states that it "*supplements*" the NEPA regulations propounded by CEQ, 40 C.F.R. §§ 1500-1508, "by applying them to DOT programs." *Id.* (emphasis in original). The Department bound its officers and units to abide by DOT and CEQ regulations under NEPA expressly "[A]ll operating administrations and Secretarial Offices shall comply with both the CEQ regulations and the provisions of this Order." *Id.* DOT's supplemental regulations go on to make clear that they apply to all "rulemaking and regulatory activities," and therefore to this rulemaking. *Id.* part 4(a). Most significantly, those regulations provide that, for all departmental actions where

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a decision has not been made to prepare an EIS, with the exception of "categorical exclusions" not relevant here, "an environmental assessment" must be prepared. *See id.* part 4(d); 40 C.F.R. § 1501.4(b). And the Order states that "[a]n environmental assessment is a document concisely describing the environmental impacts of a proposed action *and its alternatives*." DOT 5610.1C, part 4(d) (emphasis supplied); 40 C.F.R. § 1508.9(b). By adopting this Order implementing NEPA, DOT bound itself to comply with the requirement in both the CEQ and DOT regulations that alternatives be examined even in connection with an environmental assessment, or in effect even if DOT might ultimately reach a finding of no significant environmental impact and therefore dispense with an EIS. *United States v. Nixon*, 418 U.S. 683, 695-96, 94 S.Ct. 3090, 3100-01, 41 L.Ed.2d 1039 (1974); *Vitarelli v. Seaton*, 359 U.S. 535, 539-40, 79 S.Ct. 968, 972-73, 3 L.Ed. 1012 (1959); S. Breyer & R. Stewart, *Administrative Law and Regulatory Policy* 445-58 (1979).

DOT does not claim it was free to act without considering "appropriate alternatives." Its Environmental Assessment in fact considers several alternatives, all of which with the arguable exception of the "no action" alternative are exclusively concerned with optional highway routes.¹²

¹² The following nine alternatives were addressed:

1. Decline to act.
2. Route all radioactive materials shipments by highway around heavily populated areas, except for necessary pickup and delivery.

(Footnote continued on following page)

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The Department's position, instead, is based on either of two contentions. First, DOT in effect argues that it acted within its discretion in deciding to regulate first with respect to the highway mode, and thereafter possibly to consider either on its own initiative or in response to nonpreemption requests the use of other modes. Second, the Department claims that the highway mode is demonstrably safe, and therefore in effect that it could reasonably conclude that a consideration of alternative modes was unnecessary and thus inappropriate.

The Supreme Court has made clear that an agency must be afforded flexibility in choosing the procedures by which it regulates. The question here, however, is whether the

(Footnote continued from preceding page)

3. Route all highway carriers of radioactive materials by Interstate highways or freeways, except for pickup and delivery.

4. Modify alternative (2) to apply only to shipments of large quantity packages.

5. Modify alternative (3) to apply only to shipments of large quantity packages.

6. Require advance notice from shippers or carriers concerning routes and timing of large quantity shipments.

7. Apply restrictions on the shipment of radioactive materials by time of day or day of week.

8. Require specialized driver training for large quantity shipments.

9. Require the preparation of written route plans and their filing with DOT after shipments of large quantity radioactive materials.

Environmental Assessment, DOT Motion, Ex. D at 4-5.

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Department has complied with a procedural requirement imposed by the "plain language" of NEPA. *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc.*, *supra*, 435 U.S. at 548, 98 S.Ct. at 1214. The duty to consider alternatives does not prohibit an agency from reasonably narrowing the focus of its investigation, for reasons of administrative convenience or regulatory need. Thus the CEQ guidelines provide for "scoping" of environmental inquiry, in order to eliminate for efficiency reasons considerations irrelevant to the environmental review process. 40 C.F.R. §§ 1500.4(g), 1501.7. Certainly, "[a]ny agency decision maker must attempt to reduce his more complicated decisions to manageable size." Cramton & Berg, *On Leading a Horse to Water: NEPA and the Federal Bureaucracy*, 71 Mich.L.Rev. 511, 528 (1973). But project objectives cannot be manipulated in such a way that alternatives with significant potential for mitigating environmental impacts are excluded from review. The scoping process must be "early and open," but is to be completed only after the decision whether to file an EIS has been made. 40 C.F.R. § 1501.7. The proper scope of environmental review can only meaningfully be ascertained after the agency informs itself of all reasonable ways to avoid risks inherent in its proposal. *See Jordan, supra*, 3 Ecol.L.J. at 709, 716-18. Scoping is a tool properly used to focus the agency on ways to improve its proposal, not to apply blinders that will lead it to a fore-ordained result.

DOT's attempt to narrow its options was unshakable from the start and, so far as appears in the record, was made without regard for its responsibility to identify and explore mitigating measures as early in the process as possible. 40 C.F.R. § 1501.2(b) and (c); DOT 5610.1C, part 3a. "[T]o allow an agency to cast its goals

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in terms of such circumscribed objectives is antithetical to NEPA's intention that viable alternatives not be prematurely foreclosed." Note, *The National Environmental Policy Act of 1969: What "Alternatives" Must an Agency Discuss*, 12 Colum.J. of L. & Soc. Probs. 221, 243 and n.135 (1976). "The purposes of NEPA are frustrated when consideration of alternatives and collateral effects is unreasonably constricted." *Greene County Planning Bd. v. Federal Power Comm'n*, 559 F.2d 1227, 1232 (2d Cir. 1976), *cert. denied*, 434 U.S. 1086, 98 S.Ct. 1280, 55 L.Ed.2d 791 (1978). In *Natural Resources Defense Council, Inc. v. Morton*, *supra*, 458 F.2d 827, the District of Columbia Circuit held that project objectives could not be manipulated in such a way as to exclude even options outside the agency's power to regulate. Courts should be cautious in applying so expansive a reading of the requirement, since it would thrust agencies into areas "beyond their specialized knowledge." Cramton & Berg, *supra*, 71 Mich.L.Rev. at 351. But in this case, because HMTA entrusts DOT with comprehensive authority to control transport of hazardous materials, as well as with the responsibility of safeguarding the public from transport risks, all transport options, including prescribing the modes employed, are part of its statutory mandate.

DOT's claim that it reasonably excluded consideration of alternative modes is also insufficient because a review of those alternatives was logically essential to fulfill the agency's conceded obligation to consider the "no action" alternative. See *Trinity Episcopal School Corp. v. Romney*, *supra*, 523 F.2d at 93-94; 40 C.F.R. §1508.25(b)(1). In the context of this rulemaking, one consequence of taking no action would have been to leave standing local laws banning transport of certain shipments of radioactive wastes on roads between certain points. The effect

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of such laws, protecting certain areas from the effects of such shipments, is to mandate travel by another highway route or by another mode. Adequate consideration of no action therefore could not rationally be limited, as it was, to a study of conceivable impacts on the efficiency of highway transport, in isolation from other modes. See Environmental Assessment, DOT Motion, Ex. D at 8-9, 25-26. The environmental question posed by the no-action alternative was whether alternative modes were feasible and whether safety would be reduced or enhanced by the use of such modes where local regulation made it necessary. Without such an evaluation DOT's conclusion that the no-action alternative would have no effect on environmental safety was a "blanket generalization unsupported by the evidence," and hence insufficient as a matter of law to satisfy the command of § 4332(2)(E) that alternatives be studied, developed, and described. *Trinity Episcopal School Corp. v. Romney, supra*, 523 F.2d at 94. The "rule of reason" prescribes that "the discussion of environmental effects of alternatives need not be exhaustive." But DOT's consideration of the no-action option failed to meet the far less exacting requirement to provide "information sufficient to permit a reasoned choice of alternatives so far as environmental aspects are concerned." *Natural Resources Defense Council, Inc. v. Morton, supra*, 458 F.2d at 836; *County of Suffolk v. Secretary of the Interior*, 562 F.2d 1368, 1375 (2d Cir. 1977); *City of New Haven v. Chandler, supra*, 446 F.Supp. at 934.

Finally, DOT's suggestion that it could deal with alternatives at some future time is impermissible under NEPA, and as a practical matter seeks to shift DOT's duty to consider alternatives to nonfederal authorities at great cost and with little hope of fair consideration

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by DOT of any proposal to mandate an alternative mode. See, e.g., *Seacoast Anti-Pollution League v. Nuclear Regulatory Comm'n*, 598 F.2d 1221, 1231 (1st Cir. 1979). DOT has not taken upon itself the task of considering alternative modes, as part of an overall regulatory review; the agency has merely stated that it is free to consider such modes. The burden it has imposed upon states and localities to develop and justify a proposed plan that has the effect of banning highway transport between any two points is very substantial.¹³ DOT's regulations make clear that this burden could be met only after long and costly study and explication by transportation experts; meanwhile, highway transport will be mandated despite the absence of any consideration of alternative modes. Furthermore, as demonstrated in greater detail below, this burden of evaluation is imposed upon DOT not only by NEPA but by HMTA as well. Section 109 of HMTA directs DOT to develop the capability at the federal level to evaluate all risks of hazardous materials transportation. 49 U.S.C. § 1808. Finally, the record clearly reflects

¹³ DOT's Final Rule would allow a "state routing agency" to ban highway transport between specified points. 49 C.F.R. Part 177, Appendix A, § III. A. But the rule forbids local jurisdictions to do the same. Moreover, the rule overrides state bans for the substantial period required for a state to make the burdensome showing that its ban meets the criteria established in the rule. The state must establish a "comparative radiological risk assessment process at least as sensitive as that outlined in the 'DOT Guidelines.'" It must prepare an "evaluation of radiological risk wherever it may occur, and on a solicitation and substantive consideration of views from each affected jurisdiction, including local jurisdictions and other States." In addition, the state rule banning highway transport must "ensure[] reasonable continuity of routes between jurisdictions." *Id.*

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that DOT is unlikely to consider with any degree of open-mindedness a nonfederal proposal to ban entirely the use of highways between any two points, and thereby to mandate the use of an alternative mode. DOT's recent letter to New York City emphasizes the agency's conclusion in HM 164 that the use of highways is simply too safe to warrant permitting any ban. *See* pp. 1251-1252 *supra*.

We return then to DOT's second argument why a consideration of alternative modes of transport was inappropriate, and hence unnecessary: that highway transport is so safe that no carrier should be required to use another mode. This argument, like the first, can be expressed in terms of a principle recognized by decisions under NEPA. Just as an agency is permitted reasonably to scope its NEPA inquiry, it is permitted to limit the alternatives it considers in light of the projected environmental impact of its proposed rule. "The content and scope of the discussion of alternatives to the proposed action depends on the nature of the proposal." *Natural Resources Defense Council, Inc. v. Callaway, supra*, 524 F.2d at 93. Thus, if no environmental impact is entailed in the action, the duty embodied in § 4332(2)(E) is not activated. But when, as here, an agency concedes that some adverse environmental effects can be expected, the very purpose of requiring an examination of alternatives even where the anticipated effects are not "significant" in the agency's view requires that the action's relative "safety" does not by itself seal off inquiry into other, reasonable, and possibly safer courses of action. As the Second Circuit stated:

[§ 4332(2)(E)] was intended to emphasize an important part of NEPA's theme that all change was not progress and to insist that no major federal project should be undertaken without intense con-

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sideration of other more ecologically sound courses of action. . . .

Trinity Episcopal School Corp. v. Romney, supra, 523 F.2d at 93 (quoting *Environmental Defense Fund, Inc. v. Corps of Engineers, supra*, 492 F.2d at 1135). See *Jordan, supra*, 3 Ecol.L.Q. at 716-18.

The "rule of reason" governs the question of which alternatives must be explored where an action has some environmental impact. That standard, although not requiring "crystal ball inquiry," mandates "a presentation of the environmental risks incident to reasonable alternative courses of action." *Natural Resources Defense Council, Inc. v. Morton, supra*, 458 F.2d at 834, 837. The case law establishes that what is reasonable is a given case depends not only on the projected safety of the principal proposal but on several other highly pertinent factors as well: whether inquiry into a particular alternative serves a regulatory purpose under the agency's substantive mandate, *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc., supra*, 435 U.S. at 550-51, 98 S.Ct. at 1215, whether the inquiry would be infeasible or excessively expensive, *Natural Resources Defense Council, Inc. v. Morton, supra*, 458 F.2d at 837-38; whether the agency was aware of the alternative at the time of its evaluation, *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc., supra*, 435 U.S. at 551-54, 98 S.Ct. at 1215-17, and whether there was a reasonable basis at that time to believe that that alternative might mitigate harmful side-effects of the principal proposal, *id.* at 554, 98 S.Ct. at 1217 ("the showing should be sufficient to require reasonable minds to inquire further"); *Trinity Episcopal School Corp. v. Romney, supra*, 523 F.2d at 93-94. An evaluation of all the relevant considerations, including

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the safety issue, makes clear that DOT is required by NEPA to consider the alternative of barging spent fuel and other large shipments to avoid densely populated areas.

First, with respect to safety, the record shows that the risk of an extremely serious accident is "credible" and "important," even in DOT's view. The potential consequences of such an accident would concededly be very grave, and DOT acknowledges that considerable public anxiety exists over the possibility of such accidents, anxiety that is likely to have tangible costs. Furthermore, significant uncertainties exist as to the estimated probability of accidents, and the estimated consequences; and the potential effects of human error or malevolence may be immeasurable. DOT found the public risk sufficient, in fact, to order minimization through the use of available highway routes that avoid urban centers. Even assuming that this degree of public risk may properly be found to have no significant impact upon the environment, the law under NEPA establishes that the impact is sufficient to warrant an inquiry into alternatives that are otherwise appropriate.

The duty to consider alternatives potentially exists "whenever the agency action has an environmental impact." *Natural Resources Defense Council, Inc. v. Nuclear Regulatory Comm'n*, *supra*, 539 F.2d at 842 (emphasis added). See *Environmental Defense Fund Inc. v. Corps of Engineers*, *supra*, 492 F.2d at 1135 (even when proposal will on balance have a positive environmental impact, NEPA requires consideration of alternatives); 40 C.F.R. § 1508.8(b). Furthermore, public concern or controversy might itself be sufficient to meet any reasonable threshold requirement; NEPA is designed to assure the public that the nation's environmental resources are being rationally

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managed. *Aertsen v. Landrieu, supra*, 637 F.2d at 20; *cf. Hanly v. Kleindienst, supra*, 471 F.2d at 830. The record amply supports the view that the risks are sufficiently real and of sufficient concern to meet any reasonable threshold requirement.

The propriety of examining the alternative of barging large shipments is also demonstrated by its close relationship to DOT's regulatory purpose, responsibilities, authority, and expertise. While DOT expressed its regulatory purpose as limited to determining whether federally mandated routing should be established for highways, the underlying societal objective sought to be achieved was to establish necessary national routing rules for transporting radioactive materials. DOT's HMTA responsibilities in fact require that it adopt routing rules that minimize public risk without imposing unreasonable burdens. Furthermore, DOT has express authority under HMTA to order alternative modes, as well as the expertise necessary to evaluate their property. In fact, HMTA consolidated authority under DOT for the specific purpose of obtaining the safety and efficiency benefits of coordinated regulatory action. *See generally* pp. 1287-1292 *infra*.

The alternative proposal by the City and others was also a demonstrably reasonable measure, with potential for avoiding environmental harms. Barging was proposed as a measure for achieving the result sought by the rulemaking, safe transport of hazardous substances, through a different means. Its proponents demonstrated on the basis of the very reports on which DOT heavily relied, and with other apparently responsible studies, that barging might well be cost-effective, and at the same time minimize or entirely eliminate the risk of a major accident. *See* pp. 1284-1287 *infra*. These circumstances established that barg-

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ing of the shipments at issue was an appropriate alternative for study under the standards established by CEQ, DOT, and the Second Circuit. *Trinity Episcopal School Corp. v. Romney, supra*, 523 F.2d at 93. Thus, CEQ regulations require federal agencies "to the fullest extent possible" to "[u]se the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment." 40 C.F.R. § 1500.2 (e). *See also id.* § 1505.1; *id.* § 1500.2(f). DOT, in part 3a of its supplemental Order, applied these requirements to its own programs:

The identification and evaluation of the social, economic and environmental effects of a proposed action and the identification of all reasonable measures to mitigate adverse impacts shall be initiated in the early planning stages of the action, and shall be considered along with technical and economic studies. Assessment of environmental impacts should be a part of regional transportation system planning and broad transportation program development.

DOT 5610.1C, DOT Motion, Ex. C. DOT's regulations also state that "[t]he environmental review process is to be used to explore and document alternative actions that will *avoid or minimize* adverse impacts." *Id.* pt. 2(b) (emphasis supplied). This clearly is intended to achieve DOT's stated policy to "avoid or minimize adverse effects whenever possible." *Id.*, pt. 2(a)(1).

An inquiry into the barging alternative for large quantity shipments would also have been readily manageable. It was raised at the outset, and not as an effort at "unjustified obstructionism." New York City, "structur[ing]

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[its] participation so that it [was] meaningful," *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc.*, *supra*, 435 U.S. at 553, 98 S.Ct. at 1216, argued to DOT the advantages of barging as an alternative to routing large shipments of radioactive materials through some of its most densely populated areas. Commenters using DOT's comment-gathering process raised the issue. NUREG-0170 itself declared "this alternative certainly worth additional investigation." NUREG-0170 at 6-11. *See generally* Note, *Transportation of Nuclear Material: The Public Challenge*, 11 Rutgers-Camden L.J. 63 (1979). It concerned well-charted territory, since DOT already regulated transport of hazardous materials by water, including radioactive materials, and had ample material before it for reasoned analysis. The IRG, entrusted by the President with an oversight function on federal efforts to deal with the challenge posed by nuclear waste, in 1979 urged DOT to consider barging spent fuel, in addition to highway transport. IRG Report at 113, 115. Nor would its pursuit have led the agency to have to deal with a "virtually limitless" subject, or with any other alternatives for that matter. *Compare*, *Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc.*, *supra*, 435 U.S. at 552-53, 98 S.Ct. at 1216. Barging as it was proposed in HM-164 is a relatively concrete, limited, and practicable alternative for highway transport of large quantity shipments.¹⁴ DOT simply refused to con-

¹⁴ In considering this alternative, DOT should not limit its evaluation to the effects of extreme occurrences and sabotage. The record suggests that much of the radiation hazard from normal transportation and high-probability/low-consequence accidents, and

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sider the alternative, apparently because it was determined to prevent bans on what the agency eventually concluded was an "acceptably safe" mode of transport. This determined resistance to so reasonable, potentially fruitful, and manageable an inquiry frustrated NEPA's procedural scheme, adopted and reinforced by DOT itself.

2. Adequacy of DOT's References to Alternative Modes

This case is extraordinary in that, although DOT announced at the outset of the rulemaking that it intended to consider only the use of highways, and although DOT persisted in refusing to consider alternative modes of transport and in particular the barging of spent fuel, the agency and defendant-intervenors now claim that alternative modes were indeed considered. The argument is baseless insofar as it relies on DOT's repeated discussion of alternative highway routes. The argument is likewise meritless insofar as it is based on the consideration in DOT's Environmental Assessment of the "no-action" alternative. That analysis only considered foregoing the regulatory objective of establishing routing rules for radioactive materials. Improperly, it did not consider achieving the regulatory objective of assuring routes for transporting large-quantity shipments through a system that relied on barg-

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all of the predicted early fatalities, are associated with the types of shipments that are capable of creating a severe incident. In light of the uncertainties of radiation hazards, and the differing thresholds of resistance in different people, the possibility of reducing to any significant degree the public risk involved is a matter that DOT is obliged to consider, and an objective it is mandated to seek.

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ing as a mandatory supplement to highways. *See* pp. 1244, 1246 *supra*.

Defendants correctly point out, however, that DOT has in fact expressed its view on the possible utility of alternatives in reducing the public risks of highway transport. DOT asserted in its Final Rule for example, that “[o]ther modes of transport generally do not appear to offer alternatives which clearly lower public risks to the extent that the use of the highway mode should be substantially restricted.” 46 Fed.Reg. 5299 (1981). The same claim is made in DOT’s Summary and Analysis of Public Comments, which states MTB’s view that large-quantity packages “can be shipped with confidence of an acceptable level of safety and therefore such packages should not be subjected to compulsory modal shifts which result in the fractional reduction of an otherwise low risk.” Summary of Comments, DOT Motion, Ex. E, pt. H.2, at 2.

These statements, taken alone, are “blanket generalization[s] unsupported by the evidence” or by reasoning, and are inadequate as a matter of law. *See, e.g., Trinity Episcopal School Corp. v. Romney, supra*, 523 F.2d at 94; *Sierra Club v. Alexander, supra*, 484 F.Supp. at 469; *City of New Haven v. Chandler, supra*, 446 F.Supp. at 934. Where a record reflects, or it is obvious, that an alternative is infeasible, speculative, or useless, an agency may limit its discussion in its environmental assessment to an otherwise unsupported assertion. *See, e.g.,* the brief treatment of the no-action alternative approved in *Environmental Defense Fund, Inc. v. Corps of Engineers*, 348 F.Supp. 916, 951-53 (N.D.Miss. 1972). But the barging alternative for large quantity shipments could not rationally be treated in that manner, given the evidence of its utility in the record. As a “reasonable” alternative, barging should have been

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“studied, developed, and described” in a manner sufficient to permit the drawing of a reasonable conclusion as to whether it is a “reasonable measure[] to mitigate adverse impacts.” DOT 5610.1C, pt. 3(a). See *City of New Haven v. Chandler*, *supra*, 446 F.Supp. at 934. Although the description may be “brief,” 40 C.F.R. § 1508.9(b) (1981), its brevity may not be such as to circumvent DOT’s obligation, assumed in its NEPA order, to use the environmental review process “to explore and *document* alternative actions that will avoid or minimize adverse impacts.” DOT 5610.1C, pt. 2(b), (emphasis supplied). Bald conclusions unsupported by analysis do not meet an agency’s NEPA obligations to take a “hard look” at environmental issues. See *Maryland-National Capital Park & Planning Comm’n v. U.S. Postal Service*, *supra*, 487 F.2d at 1040. The only significance in DOT’s assertions is that the Department’s apparent need to make them underscores the indispensability of considering alternative modes.

Defendants argue, however, that DOT’s assertions concerning alternative modes must be read along with the evidence in the record; that the reports underlying DOT’s Environmental Assessment do consider alternative modes; and that the evidence developed in those reports supports DOT’s conclusion that alternative modes would not materially reduce overall public risks. Although this case requires an examination of the merits in these arguments, reports by other agencies included in the record cannot be used as a substitute for DOT’s responsibility to study, develop and describe alternatives. CEQ and DOT regulations require the agency independently to evaluate the record, explore and document alternatives, and actually consider them “along with technical and other studies.” 40 C.F.R. §§ 1507.2(d); 1506.5(b); DOT 5610.1C, pts. 2(b),

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3(a). An environmental assessment may be far less rigorous than EIS. But its purposes are similar: to assist agency compliance with NEPA and to enlighten the Congress, the public, and reviewing courts as to the underlying decisionmaking process. As the Second Circuit stated in *Hanly v. Mitchell*, 460 F.2d 640, 647 (2d Cir.), *cert. denied*, *Hanly v. Kleindienst*, 409 U.S. 990, 93 S.Ct. 313, 34 L.Ed.2d 256 (1972), and repeated in *Hanly v. Kleindienst*, *supra*, 471 F.2d at 836, NEPA requires federal agencies, even outside the context of an EIS, to "affirmatively develop a reviewable environmental record."

What DOT did in this case does not even amount to a "staple job," where an agency at least collects the relevant information in one place and prepares a brief, overall description. *See Jordan, supra*, 3 Ecol.L.Q. at 724. Here DOT has left to the court and to interested parties the arduous task of reading through massive and technical studies, and a huge record, for evidence relevant to the agency's assertions. Placing such a burden on individuals outside the agency violates the central NEPA tenet that "NEPA procedures must insure that environmental information is available [P]ublic scrutiny [is] essential to implementing NEPA." 40 C.F.R. § 1500.1(b). Moreover by itself this failure to organize in any way or even to cite to relevant parts of the underlying studies—to "document" the alternatives as required in DOT 5610.1C, pt. 2(b)—suggests a corollary abdication of DOT's NEPA duty independently to evaluate the outside sources of environmental data.

The record in any event not only fails to support DOT's assertions concerning alternatives, it refutes the agency's claim insofar as it relates to barging spent fuel and other large quantity shipments. NUREG-0170 and

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SANDIA do establish that accident rates for various modes of transport are such that the use of alternative modes will not reduce overall risk. The rates for trucking and barging in that regard are statistically indistinguishable for present purposes. NUREG-0170, p. 5-5 (truck: 1.06×10^6 barges: 6.06×10^6 per vehicle/kilometer). *See also id.* at viii; SANDIA at 11. But the weakness in DOT's analysis is fundamental. However accurate DOT may be in stating that the general use of alternative modes would have little effect upon overall public risk estimates, the observation has no bearing on the specific risks at issue in this litigation. Plaintiffs have never claimed DOT should consider alternative modes for all types of shipments. They have only argued that DOT must consider alternatives to the use of highways for spent fuel and large-quantity shipments through densely populated areas. These large-quantity shipments constitute less than 0.5% of all shipments. Consequently, general data on the effect of changing all shipments from highway to barge, for example, merely obscures the real issue.

Furthermore, NUREG-0170 and SANDIA refute DOT's assertions insofar as those reports provide data and analysis on the specific types of shipments at issue. The evidence in NUREG-0170 strongly supports the view that barging of large quantities of radioactive materials, and particularly of spent fuel, could not credibly result in the sort of high-consequence accident feared by plaintiffs, for two separate and equally compelling reasons. First, NUREG-0170 concluded that the nature of barge transportation was such that an accident that would rupture a spent-fuel cask could not realistically occur. Barges cannot move fast enough, or burn long enough, to cause rup-

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tures associated with Category VII and VIII accidents on highways. Ruptures of barged casks carrying spent fuel would be likely to occur only if they were sunk in deep water (over 3000 meters), or deteriorated at shallower depths over a period of hundreds or thousands of years. In either case, the environmental consequences of a single incident would be minimal, NUREG-0170 concluded, certainly not comparable to the disastrous potential of a severe highway accident. *Id.* 5-16 to 5-20.¹⁵ NUREG-0170 also estimated that none of the serious accidents contemplated (i.e., deemed credible) for barge travel (Categories V through VIII) could be expected to occur in a "high population" zone. *Id.*, Table 5-7, pp. 5-19; *see also* Table

¹⁵ Among the relevant considerations DOT should weigh in evaluating the barging alternatives is the relative accident rates of truck and barge transport. *See, e.g.,* National Transportation Safety Board, *Safety Effectiveness Evaluation* 6 (NTSB SEE-81-2) City Motion, Ex Q (footnote omitted):

Nearly 95 percent of the hazardous materials carriers surveyed in a 1978 study by the BMCS had violated the driver hours-of-service rules; in the same study, hazardous materials carriers had "the worst record [for] preventable accident frequency rate" (20 percent more involvement than expected).

From 1971 through 1979, at least 183 people have been killed as a direct result of hazardous materials unintentionally released during transportation; at least another 3,941 have been injured under the same circumstances, and at least \$58,253,869 in property damage has resulted.

Compare the data and sources referred to in Affidavit of Lindsay Audin, ¶ 17, City Motion, noting that there has been no incident in seven years of Coast Guard reporting of a spill from a barge shipment of radioactive materials, although barges move over 300,000 tons of such material annually.

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I-6, App. I at I-7. This means that even the worst catastrophe imaginable for barge transport would be incomparably less severe than accidents credibly anticipated for highway transport according to the analysis in NUREG-0170.¹⁶ Moreover, although the issue was not addressed in any of the studies before DOT or this Court, given that barges would by-pass population centers and that for much of their journey they would be inaccessible except by boat, barging might significantly reduce the likelihood and consequences of theft, diversion, and sabotage.

NUREG-0170 specifically addressed the cost-effectiveness and feasibility of barging irradiated (spent) fuel. Barging was seen as a feasible alternative in many geographic areas, since "approximately 74 percent of the projected 1985 nuclear generating capacity will be sited within 80 kilometers of navigable waterways (including the ocean), and 88 percent will be sited within 240 kilometers of navigable waterways."¹⁷ The only projected reprocessing site,

¹⁶ These conclusions—that spent fuel casks cannot be expected to rupture in any conceivable barge accident, and that there is little environmental risk if a cask sinks in either shallow or deep ocean waters—are confirmed by an EPA-sponsored study, noted in *Current Status and future Considerations for a Transportation System for Spent Fuel and Radioactive Waste (AGNS)*, City Motion, Ex. U at 55. Another study supports the view that, although a rupture is less likely in barge than in highway transport, it is nevertheless possible. See National Environmental Studies Project, *A Generic Assessment of Barge Transportation of Spent Nuclear Fuel* (AIF/NESP-014), ch. 5 (1978) ("NESP").

¹⁷ The NESP study, sponsored by the Atomic Industrial Forum, concluded that "[i]ntermodal transport represents a viable altern-

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in Barnwell, South Carolina, "is approximately 48 kilometers from navigable water." *Id.* 6-9. The report then goes on to analyze overall annual radiological impacts from a shift to barging of irradiated (spent) fuel (about 212 barge shipments each carrying two rail casks), and the costs of barging, as compared to other modes.¹⁸ It concludes that barging is cost effective:

The fact that transportation costs are so much lower for barges than for other modes makes this alternative certainly worth additional investigation.

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ative to rail and truck transport, especially for sites near navigable waterways which do not have rail service." NESP Study at vii. In particular the study found: "Approximately 90% of the sites with presently operating reactors, and 80% of the sites with reactors expected to be on line by 1985, have definable intermodal routes in which more than 90% of the mileage is waterborne." *Id.* at v. See also City Motion, Ex. U (study noting the successful use of intermodal transport of spent fuel in Great Britain and Japan); Ex. S (study indicating the feasibility of moving spent fuel by barge from East Coast reactors to the Steel Landing depot near the DOE spent fuel repository at the Savannah River Plant in South Carolina.

¹⁸ The NESP Study states that, at least initially, barging spent fuel may be more costly than highway transport, largely because of the greater amount of time barging requires, NESP Study at vii. Barging may, however, have an advantage over highway transport in that barges can carry large railway casks, for which the proposed reprocessing facilities at Barnwell, South Carolina, and Oak Ridge, Tennessee, are designed. *Id.*, preface. See *Current Status and Future Considerations for a Transportation System for Spent Fuel and Radioactive Waste*. (AGNS 1978) at 50, also available to DOT, for summary of the advantages and disadvantages of intermodal transport.

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Barge transportation of irradiated fuel may be a viable alternative, at least for some specific reactor sites, if not as a nationwide scheme.

Id. 6-11. Finally, in summarizing its consideration of several alternative modes and methods of transportation, NUREG-1070 concludes: "The alternative of shipping spent fuel by barge, where feasible, appears to be the most cost effective." *Id.* at 6-25.¹⁹

¹⁹ Plaintiffs have also noted that a 1975 study by the engineering firm of Dames & Moore concluded that barge shipments of spent fuel from the Shoreham Nuclear Power Station were feasible. The firm was selected by the architect-engineers of Shoreham to perform an analysis of available transport modes. It recognized that the public risks of highway transport were low, but also noted significant potential reductions through barging in the normal radiation dose from spent fuel transport, as well as in expected annual accident risk. "The shipment of spent fuel by barge for long distances has not been practiced in the U.S.," the report noted, but BNL had used barges between 1962 to 1966 to move its spent fuel from the Brooklyn Marine Terminal across New York Bay to Jersey City or Port of Elizabeth. That method was terminated because of difficulties with railroad. *Final Report: Study of the Shipments of Spent Fuel from the Shoreham Nuclear Power Station to the Reprocessing Plant* 4-2 to 4-3 (1975). The report also found that a docking facility at Shoreham could be modified to handle spent fuel shipments. The reactor's pressure vessel, weighing 500 tons, was delivered to Shoreham by barge, and the company that made the delivery "states it would not be a problem to extrapolate their experience to spent fuel casks." *Id.* at 4-11. The report also found that "[b]arges are available for accommodating the full range of casks being considered either as separate units, or with the accompanying conveyance." *Id.* at 4-10 to 4-11. Although the report does not demonstrate the feasibility of

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The SANDIA report is in no respect inconsistent with the conclusions regarding barging found in NUREG-0170. SANDIA's analysis of barging is not limited to large shipments; it treats barging as a general alternative, and it assumes that after barging all shipments would in any event have to be transported by truck to destination points within the urban area involved. See, e.g., SANDIA at 143 ("Regardless of the transport mode chosen, there is still the possibility of an accident anywhere along the route within the urban area."); *id.* at 142-44; *id.* Table 6-15, at 175 (comment on transport mode shifts.) As SANDIA notes, however, "estimation of the changes resulting from alternate transport modes would depend heavily on those materials chosen for alternate mode transport and the actual modes used." *Id.* 143. SANDIA's analysis would have been relevant had it assumed that all spent fuel shipments, and most if not all other large-quantity shipments, would never need to enter New York City; spent fuel could be shipped from Long Island to points south or north of the City, perhaps even to Barnwell, South Carolina, as suggested in NUREG-0170.

(Footnote continued from preceding page)

barging and its utility in reducing risks, its existence provides additional evidence that DOT simply refused to consider the alternative, and that to the extent DOT purported to consider the alternative its conclusion has no support. The study is properly before the Court on the issue of the adequacy of DOT's environmental assessment. *County of Suffolk v. Secretary of the Interior*, 562 F.2d 1368, 1384-85 (2d Cir. 1977, *cert. denied*, 434 U.S. 1064, 98 S.Ct. 1238, 55 L.Ed.2d 764 (1978)). DOT recently characterized this study as "anecdotal," even though the study relates specific experiences and represents that one knowledgeable firm is confident it can barge spent fuel from the Shoreham plant. The record contains conflicting comments on the feasibility of barging.

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Insofar as SANDIA contains information relevant to the alternative at issue, it supports the proposition that barging would significantly reduce the risks of high-consequence accidents. Thus, in its analysis of routing large shipments around the City by highway, SANDIA perceives marked reductions in both health and economic risks:

The potential latent cancer fatalities from Po-210 and Pu are reduced to a few percent (1%-2%) of the values for the urban route. This is a significant reduction for the Pu source because of the relatively large number of expected latent cancer fatalities. The reduction in economic impacts is also significant (95%-99% reduction), since the cost of severity VIII accidents could be of the order of a billion dollars in urban areas.

Id. 159; *accord, id.* 167-68; *see also id.* pp. 149-50 (eliminating large-quantity shipments significantly reduces public risk). Finally, nothing in SANDIA casts doubt upon the conclusions of NUREG-0170 regarding the feasibility and cost-effectiveness of barge transport.

Indeed, DOT's conclusory statement that "[o]ther modes of transport generally do not appear to offer alternatives which clearly lower public risks" is inconsistent even with the conclusion expressed by its Attorney Advisor Douglas Crockett. Speaking at a hearing in New York City on June 13, 1980, Mr. Crockett remarked:

We have now found that transportation by barge is a safe, and probably safer way to go than by highway. That is what the data indicates. The distinction between the two, I can only tell you

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what I read. I am not the man who did the study. Speaking reasonably, it would appear that you have water out there, and the facilities you are talking about are fairly close to the water. There has been some testimony . . . about some costs that you are aware of. Yes, it would be more expensive but we have also got a problem in taking that kind of material across the country.

Transcript on Hearing of Highway Routing of Radioactive Materials: Proposed Rulemaking, Administrative Record file No. 73 at 234 (June 13, 1980).²⁰

These materials hardly represent an exhaustive study of the alternative of barging; NUREG-0170 recommends further analysis. Nor are they presented here to establish that barging is a feasible alternative to highway transport of large-quantity shipments through densely

²⁰ Barging has long been used in the United States to transport hazardous materials. DOT has extensively regulated the barging of hazardous materials in a variety of areas. 49 C.F.R. pt. 176 (1980) ("Carriage by Vessel") General requirements of the NRC and DOT concerning the transport of radioactive materials already apply to barge transport. *E.g.*, 10 C.F.R. § 171, subpart C (1980); 49 C.F.R. §§ 173.393, 173.398 (1980). They demand safe containerization, and adequate measures to prevent critically, *i.e.*, the accumulation of enough fissile material to cause a nuclear chain reaction. In addition, DOT has regulated several specific aspects of barge transport of radioactive materials, including required signs, permissible dosage levels, proper storage arrangements, and response to leakage and contamination. *Id.* §§ 176.700, 176.710, 176.715. Moreover, the specific safety requirements of transporting spent nuclear fuel were extensively considered by a subcommittee of the American National Standards Institute ("ANSI"). In October 1976, ANSI issued a "Draft Proposed Guide for Water Transportation of Irradiated Nuclear Fuel" (ANSI N-14).

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populated areas. Rather, they are referred to because they establish that defendants' suggestion that DOT has adequately examined the barging alternative as to the issue in dispute is untenable. DOT's cursory dismissal of alternative modes of transport as insignificant from a safety standpoint is a "blanket generalization unsupported by the evidence. *Trinity Episcopal School Corp. v. Romney*, *supra*, 523 F.2d at 94; *cf. Federal Trade Comm'n v. Sperry & Hutchinson Co.*, 405 U.S. 233, 249, 92 S.Ct. 898, 907, 31 L.Ed.2d 170 (1972); *Citizens to Preserve Overton Park v. Volpe*, *supra*, 401 U.S. at 416, 91 S.Ct. at 823.

The record indicates that the alternative of barging spent fuel and other large-quantity shipments to avoid densely populated areas may be a reasonable means for achieving the safest possible, economically feasible, transport of the materials involved. DOT's failure to "study, develop, and describe" that alternative constitutes a "substantial" violation of § 4332(2)(E), and of its own regulations. *Vermont Yankee Nuclear Power Corp. v. Natural Power Corp. v. Natural Resources Defense Council, Inc.*, *supra*, 435 U.S. at 558, 98 S.Ct. at 1219.

IV. DOT's Substantive Obligations Under HMTA

Apart from DOT's duty under NEPA to evaluate the environmental consequences of its proposed actions, the Department is obliged, when promulgating rules under HMTA, to comply with the substantive standards laid down by HMTA and with the Administrative Procedure Act (APA) standards for valid rulemaking. DOT's Final Rule fails to satisfy both obligations. It is invalid insofar as DOT relied in issuing the challenged rule on the

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view that HMTA forbids or discourages DOT interference with carrier choice of transportation modes, and on the view that HMTA permits DOT to deem certain levels of "credible," high-consequence risk acceptable even though they are avoidable. HMTA mandates that DOT, in exercising its broad regulatory powers, adopt reasonable measures to maximize safety in hazardous-materials transportation. Furthermore, because DOT failed adequately to consider the risks of transporting large-quantity radioactive materials by truck through densely populated areas, and failed to establish any need for such transport, its decision to impose those risks on unwilling nonfederal jurisdictions is invalid under HMTA and is arbitrary, capricious, and an abuse of discretion under the APA. 5 U.S.C. § 706(2)(A) (1976).

As justification for limiting its proposed regulations to the highway mode DOT sometimes stated, and frequently suggested, that it was either required or authorized by HMTA to limit itself to evaluating the propriety of modal choices made by industry. The view was implicit from the outset in DOT's frank avowal that the reason that had led it to commence HM-164 was to evaluate whether local bans on the highway transport of any type of radioactive material could be justified. The view was clearly expressed, moreover, in DOT's Summary and Analysis of Comments, in response to the suggestion that the dangers of spent fuel and large quantity shipments justified a ban on their transport through densely populated areas. Although an accident of grave magnitude could occur, DOT claimed for itself the power and responsibility to decide whether the activity should proceed. It found the probability of such accidents so low that large packages could be transported by highway "with confidence of an acceptable level of

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safety," and stated that its decision to limit itself to deciding whether to allow highway travel as sufficiently safe, rather than to consider mandating other modes, was a "policy . . . consistent with MTB's history of recognizing the inherent risk appropriate to the transportation of particular hazardous materials by each of the modes, and its reluctance to specify an order of precedence in the choices available to shippers regarding the physical state of their materials, packagings, quantity, amount, and the like." DOT Motion, Ex. E, pt. H.2 at 2 (full statement quoted above). The defendant-intervenors no doubt share DOT's premises. Indeed they seem to take the stronger view that DOT's role is limited to improving the safety of transportation modes chosen by carriers:

Although the DOT has responsibilities relating to the regulation of all modes of transportation, it is not, by virtue of the HMTA, a comprehensive transportation planning agency with responsibility to mandate the use of a particular mode of transportation for the carriage of each type of hazardous materials. Rather, its role is to ensure that the modes chosen by shippers and carriers are used in a safe manner. Nor does the HMTA expressly or impliedly call for such a calculus.

Defendant-Intervenors' Memo. of Law in Support of Summary Judgment at 30.

The precise meaning and full implications of these views concerning DOT's role need not be developed. Defendants seem clearly to contend, however, that DOT can at least choose to limit its responsibilities under HMTA to ensuring that some minimum safety or "acceptable" standard is met in the transportation of hazardous materials by what-

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ever mode of transportation a carrier selects. In this view, DOT may have no authority, and certainly has no obligation, to regulate carrier choice of transportation made, unless safety in that mode falls below some minimum or "acceptable" level. Nor in this view is DOT obligated to formulate and impose on carriers any requirement that reduces risks below a level at which DOT reasonably concludes that transportation safety is "acceptable," even if such a requirement neither imposes an unreasonable burden on commerce or on carriers, nor interferes with the accomplishment of any other national policy.

Defendants' conception of DOT's obligations is incorrect. Although plaintiffs no doubt overstate the limits on DOT's discretion in exercising its regulatory authority, *see* pp. 1253-1254 *supra*, HMTA defines a much broader role for DOT than defendants suggest, and it contains no such artificial restriction on DOT's authority to regulate carrier choice of transportation modes. Although any federal agency in this nation should respect and avoid needless interference with a regulated entity's choice of how it wishes to achieve its market objectives, agency deference is impermissible to the extent it conflicts with the agency's legislative mandate. HMTA's mandate to DOT is to promote public safety, a simple yet strong directive that obligates DOT not only to consider alternatives to proposed regulations but also, when considering alternatives, to adopt the safer option unless it is impractical, or unless DOT reasonably concludes that to do so could impair some other national policy, such as protecting the necessary flow of commerce in industries using radioactive materials. It is, in other words, impermissible, in the face of a credible risk with substantial potential consequences, for DOT to declare a certain level of safety "acceptable" regardless of

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the possibility of achieving higher levels through reasonable measures.

Both the statutory language and the legislative history of HMTA establish that Congress imposed on DOT a responsibility to take all measures consistent with the needs of commerce to promote safety in hazardous-materials transportation. Congress first regulated the transportation of dangerous materials in 1871, when it gave the Coast Guard responsibilities in the area. In 1909 Congress gave the Federal Highway Administration and the Federal Railway Administration powers and duties to promote safety in the transportation of hazardous materials. *See* 18 U.S.C. §§ 831-835 (1976). The Federal Aviation Administration assumed a similar role in 1958, 49 U.S.C. § 1421 (1976), and two years later Congress severely restricted the transportation of radioactive materials by passenger carriers on land, 18 U.S.C. § 831 (1976).

Congress first comprehensively addressd the problem of hazardous-materials transportation in the Hazardous Materials Transportation Control Act of 1970, Pub.L.No.91-458, Title III, 34 Stat. 977 (1970), one year after enacting the National Environmental Policy Act. A report to the House Committee on Interstate and Foreign Commerce prepared in 1974 explained that the purpose of the 1970 Act was to "begin . . . to develop ways and means to reduce and prevent . . . attacks [by hazardous materials in transit] on our environment and on our very lives.'" Staff of House Committee on Interstate and Foreign Commerce, 93d Cong., 2d Sess., *Railroad Safety* 3 (Comm. Print 1974) (quoting Chairman of National Transportation Safety Board) [hereinafter "*Railroad Safety*"]. The 1970 Act directed the Secretary of Transportation to (1) build a technical staff capable of evaluating the risks of hazard-

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ous-materials transportation, (2) establish a centralized system for reporting of accidents, and (3) "conduct a review of all aspects of hazardous materials transportation to determine and recommend appropriate steps which can be taken immediately to provide greater control over the safe movement of such materials." Pub.L. No. 91-458, § 302(a)(3), 84 Stat. 977 (1970). DOT attempted to carry out this virtually single-minded investigatory mandate, but funding was inadequate. By 1974 Congress had increased funding for DOT to fulfill "safety responsibilities," Letter of Transmittal accompanying H.R. 14076 (March 20, 1974), printed in *Railroad Safety, supra*, at 17-19, and directed DOT specifically to report "'on proposed revised handling procedures and feasibility of alternative routing in order to avoid population centers.'" *Railroad Safety, supra*, at 4 (quoting Pub.L. No. 93-90, 87 Stat. 305 (1973)).

The several reports that DOT prepared for Congress in the early 1970s indirectly evidence DOT's own understanding of its role in the field of hazardous-materials transportation prior to 1975. Various statements in the reports indicate that DOT viewed in its mission as a broad one defined by a predominant concern for safety. Thus, in describing the range of regulatory actions DOT had taken, one report noted that DOT had drafted an "Emergency Services Guide for Selected Hazardous Materials" in order "to minimize the immediate hazard impact of spills encountered in the overland bulk transportation of certain selected hazardous materials." *Id.* at 56. Regarding exemptions from the safety requirements set by DOT regulations, the same report says: "A waiver or exemption is not granted which would compromise the safety level imposed by the regulations." *Id.* at 58. In addition to thus declaring to Congress its commitment to safety, DOT rep-

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resented to Congress its intention to comply with the statutory directive to study "alternative routing in order to avoid population centers." When the Federal Railroad Administration received a study it had commissioned, said DOT, "they will take the action that is deemed necessary for safety in rail transportation of hazardous materials." *Id.* at 59.

Against this background of ever-increasing concern with safety, Congress established the present statutory framework in 1974. The Senate Committee on Commerce, reporting on the bill that as modified became HMTA, said that DOT's annual reports "indicate that further intermodal coordination and more pervasive regulation are needed for an effective program aimed at the *elimination of the risks* involved in the transportation of hazardous materials." S.Rep.No.1192, 93d Cong., 2d Sess. 7 (1974) (emphasis added). It was to implement this objective that the legislation was proposed. *Id.* The existing regulatory structure was found fragmented and noncompliance with safety standards was rife. *Id.* at 7-8. In order "to increase the operational safety of all modes of transportation and thereby to reduce loss of life, personal injury, and damage to property," the legislation "increas[ed] the regulatory authority" of DOT. *Id.* at 1. The legislation, explained the Senate Committee, "will make possible for the first time a *comprehensive approach to minimization of the risks* associated with the movement of valuable but dangerous materials." *Id.* at 2 (emphasis added). The Secretary of Transportation was therefore given broad power "to promulgate regulations governing 'any safety aspect of the transportation of hazardous materials.'" *Id.* (quoting § 105(a) of S. 4057). See *Kappelman v. Delta Air Lines, Inc.*, 539 F.2d 165, 169-70 (D.C. Cir. 1976).

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HMTA contains no restrictions on DOT's obligation to minimize risk. Its general declaration of policy does not even expressly require DOT to balance commercial interests against safety interests. Rather, it says:

It is declared to be the policy of Congress in this title to improve the regulatory and enforcement authority of the Secretary of Transportation to protect the Nation adequately against the risks to life and property which are inherent in the transportation of hazardous materials in commerce.

HMTA § 102, 49 U.S.C. § 1801 (1976). In accordance with that broad mandate, the Act defines DOT's regulatory power in terms of safety, not in terms of any other interests: "The Secretary may issue . . . regulations for the safe transportation in commerce of hazardous materials." *Id.* § 105(a), 49 U.S.C. § 1804(a) (1976). And the scope of DOT's regulatory power is broad: "Such regulations may govern any safety aspect of the transportation of hazardous materials which the Secretary deems necessary or appropriate . . ." *Id.* The list of permissible subjects of regulation that follows is expressly asserted to be nonexhaustive. Nothing in this broad definition of DOT's regulatory authority, read in light of the safety goal of the statute, suggests that DOT is obliged, or is even permitted absent good reason, to acquiesce in a carrier's choice of transportation mode. As the Senate Committee on Commerce stated: "The section gives the Secretary a broad mandate so that comprehensive regulations can be issued as the need arises covering whatever facet of the transportation requires regulation." S.Rep.No.1192, 93d Cong., 2d Sess. 82 (1974).

Other parts of the statute give DOT similarly clear and broad powers and responsibilities to promote safety. Sec-

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tion 106(a)'s authorization for DOT "to establish criteria for handling hazardous materials" is as broad as section 105's authorization regarding transportation. Moreover, the criteria "may include . . . specifications regarding the use of equipment and facilities used in the transportation of such materials"; this provision is broad enough by its terms to authorize regulation of carrier choice of mode of transportation, if an express authorization were necessary. *Id.* § 106(a), 49 U.S.C. § 1805(a) (1976). Further, section 107 of HMTA grants DOT power to exempt carriers from established requirements, not on a finding of commercial need, for example, but on a finding that an exemption promotes safety. *Id.* § 107, 49 U.S.C. § 1806 (1976). The Secretary's broad responsibility in regulating hazardous-materials transportation is also evident in the investigatory powers granted DOT in section 109, as well as in that section's directive that DOT "establish and maintain facilities and technical staff sufficient to provide, within the Federal government, the capability of evaluating risks connected with the transportation of hazardous materials" and "conduct a continuing review of all aspects of the transportation of hazardous materials in order to determine and to be able to recommend appropriate steps to assure the safe transportation of hazardous materials." *Id.* § 109, 49 U.S.C. § 1808 (1976). Thus, the Secretary has the responsibility to develop up-to-date information on safety and to recommend means for increasing safety wherever possible.

That DOT's authority extends to regulating carrier choice of transportation mode is also shown by section 111(b) of HMTA, which gives DOT the power to petition a District Court "for an order suspending or restricting" any transportation presenting an "imminent hazard" "or

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for such other order as is necessary to eliminate or ameliorate such imminent hazard." *Id.* § 111(b), 49 U.S.C. § 1810(b) (1976). It may be inferred from HMTA's definition of "imminent hazard"—one exists "if there is a substantial likelihood that serious harm will occur prior to the completion of an administrative hearing or other formal proceeding initiated to abate the risk of such harm," *id.*—that a similar power must be available to the Secretary in promulgating rules. The preemption provision of HMTA, too, indicates that DOT is obligated to advance safety where possible, even to the extent of authorizing states or localities to prohibit carriers from using particular modes of transportation. Section 112(b) directs the Secretary to consider nonpreemption requests on two bases: whether safety would be enhanced and whether commerce would be burdened. *Id.* § 112(b), 49 U.S.C. § 1811(b) (1976). That directive would permit the ban of certain transportation modes on the necessary showing; it nowhere suggests that, absent an objectionable effect on commerce, a safer nonfederal requirement should be denied effect because the federal requirement provides for "adequate safety."

DOT's responsibilities gain further definition from HMTA's provision on air transportation of radioactive materials. Section 108(a) provides that within 120 days of HMTA's enactment, DOT must issue regulations concerning

the transportation of radioactive materials on any passenger-carrying aircraft in air commerce. . . . Such regulations shall prohibit any transportation of radioactive materials on any such aircraft unless the radioactive materials involved are intended for use in, or incident to, research, or medical diag-

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nosis or treatment, so long as such materials as prepared for and during transportation do not pose an unreasonable hazard to health and safety.

Id. § 108(a), 49 U.S.C. § 1807(a) (1976). The Senate Committee explained that this provision was adopted because safety problems with air transportation were evident and severe. "At the same time," said the Committee,

testimony indicated that most current air shipments of radioactive materials are not necessary, and that alternate transportation could be arranged without affecting the essential programs utilizing the materials. Only in the medical or research field is a clear-cut case made for the necessity of shipments by air, and then only when the attendant risks are reasonable.

S.Rep.No.1192, 93 Cong., 2d Sess. 9 (1974).

Thus Congress explained its willingness to condition use of a particular mode of transportation on two findings: first, that use of that mode was necessary, *i.e.*, no safer alternatives were available; second, that even where necessary, use of the particular mode presented no unreasonable hazard.

Congress had sufficient information about the safety of air transport to enable it to write requirements into the statute. For other modes of transportation, further study was necessary, so Congress gave responsibility to DOT to assess risks and establish safety requirements, empowering it to regulate any aspect of transportation and directing it to undertake investigations of safety in order to exercise its regulatory authority. In accordance with the decision Congress made about air transportation,

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HMTA should be read as requiring DOT, when regulating to investigate potentially safer alternatives to any mode of transportation under consideration or permitted by DOT, and to choose the safer alternative (including the alternative of no transportation) absent a conclusion that doing so would be unreasonable or would interfere with some other national policy. Any narrower interpretation of DOT's obligations under HMTA would conflict with Congress' clear intent, as reflected in the history and language of the statute, to promote safety where reasonably possible.

This view of DOT's obligations under HMTA—to maximize environmental safety through all reasonable means, and to evaluate alternatives to that end—is unambiguously expressed by the agency itself in its own NEPA regulations. These NEPA regulations have binding substantive effect upon DOT; agencies are bound to follow their own rules. *See* pp. 1277-1278 *supra*. There substantive effect aside, however, the regulations are a far more authoritative and well considered view of DOT's regulatory obligations than its statements or conclusions in HM-164.

These statutory obligations render DOT's Final Rule invalid for several reasons. The failure of DOT adequately to assess the likelihood and consequences of accidents, human error, and malevolence made the agency incapable of justifying a routing rule for spent fuel and large-quantity radioactive materials that overrides non-federal regulation aimed at avoiding those risks in densely populated areas. Furthermore, such a rule bears a burden of justification under HMTA, which DOT failed adequately to meet. Thus, the agency failed to develop a record that demonstrates some need for overriding

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local rules keeping spent fuel and other large-quantity shipments out of densely populated areas. Commenters charged that no real need exists for DOT's action, and that its routing rules as they relate to spent fuel are "nothing more than a method of accommodating the transportation requirements of the nuclear power industry." 46 Fed.Reg. at 5299. DOT's only detailed response concerning need relates to shipments that its Final Rule can lawfully protect. The record reflects with respect to New York City's ban that neither BNL nor any other facility currently needs to transport its spent fuel anywhere, let alone through densely populated areas²¹ Our nation has

²¹ Mr. Ravthon General Counsel to American Universities, Inc., which runs BNL, had the following exchange with Douglas A. Crockett, hearing Chairman, Research and Special Programs Administration, and with William R. Fiste, of the Federal Highway Administration:

Chairman Crockett: One question, Mr. Rathvon. How much storage room do you figure you have at Brookhaven?

Mr. Rathvon: Well, it's a question of—

Chairman Crockett: How much time really?

Mr. Rathvon: Well, we can go at least three more years by adding more racks. If we have to go beyond that point we will activate another facility that's been shut down, a gamma source facility, assuming the safety requirements can be readily met. But all of this takes funds from some very poor parishes. Our chemistry and biology programs are underfunded so we are losing research. It can be done; I'm not trying to say we are shutting down. We will keep going as long as we can.

Mr. Fiste: A question on the storage: Does that present any problem to the people of New York—storing it there?

Mr. Rathvon: No, Sir. This has been examined, not by

(Footnote continued on following page)

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yet to decide what it intends to do with spent fuel. Until it decides, the official policy recommended by the IRG is that spent fuel be stored where it is generated, until space runs out. IRG Report 100-01. DOT has not even mentioned, let alone considered, this highly relevant policy. Finally, even assuming an adequate record were made on the need to transport spent fuel and other large-quantity radioactive materials, DOT failed to develop a record that would justify their transport by truck through densely populated areas despite local laws prohibiting such shipments. As discussed above, DOT failed to examine and determine whether barging is an alternative mode of transport that could satisfy the need identified without unreasonable cost to industry or the public.

V. Conclusion

For all the foregoing reasons, therefore, the Final Rule is arbitrary, capricious, and an abuse of discretion insofar as it overrides nonfederal bans on truck transportation of spent fuel and other large-quantity radioactive materials though densely populated areas such as New York City. NEPA does not require DOT to avoid low-probability/high-consequence accidents, or to choose any particular alternative. But NEPA requires that an adequate environ-

(Footnote continued from preceding page)

us, but by DOE, and they are the things that are regularly used to store radioactive elements that are brought of the reactor until certain amount of radioactivity until we can ship them. We will just keep them there longer and put more of them there.

Transcript of Public Hearing on the Highway Routing of Radioactive Materials, Administrative Record file No. 40 at 203-04.

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mental assessment be prepared, which makes a rational finding of no significant impact, and which considers all appropriate alternatives. HMTA does not require DOT to maximize safety at any cost or to choose safety over all other policies. But HMTA forbids DOT to choose the less safe of two alternatives without any legitimate reason for doing so.

DOT may well have reached its conclusion in HM-164 because of its genuine conviction that highway transport is safe. It has implemented its judgment, moreover, with a courageous willingness to accept responsibility for the decision. The national interest no doubt sometimes requires courageous regulation in the face of public opposition on issues commanding extraordinary media attention. But the laws being administered by DOT do not demand regulatory valour so much as they demand care. Both NEPA and HMTA require a full environmental assessment, including a study of appropriate alternatives, and HMTA mandates the elimination through reasonable means of all credible risk not inherent in the transport of radioactive materials. It may be good policy in the agency's view to override state and local efforts that prevent any reasonably safe use of a transportation mode, and to force an unwilling public to bear risks that are reasonable compared to others commonly accepted. But these are not Congress' policies. Congress has mandated that important and reasonably avoidable risks not be borne, and specifically recognizes the propriety of local efforts to increase safety.

The appropriate equitable remedy for the inadequacies of DOT's Final Rule, on this record, is not a blanket injunction against nationwide enforcement. Such a remedy would be too sweeping, ignoring the many lawful aspects

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and applications of the Rule and undermining the legitimate goal of achieving regulatory uniformity where appropriate. The Rule is invalid only insofar as it overrides nonfederal bans on the highway transport of large-quantity radioactive materials through densely populated urban areas, and it is invalid as applied in those situations because DOT inadequately considered the "worst-case scenario" and failed to study appropriate alternatives. The second in this case demonstrates that in New York City high-consequence accidents are "credible," and the City proposed an alternative to highway transport, viz., barging, that was sufficiently well supported by the record that both NEPA and HMTA required DOT to consider it. It is therefore appropriate to enjoin application of the Final Rule to New York City, to the extent it is invalid.

With respect to other jurisdictions, in New York State and around the nation, the record does not contain sufficient information to warrant enjoining application of the Final Rule. Much of the information before DOT and this Court, including the SNDIA report, focuses on New York City. There is no adequate basis in the record to specify precisely which jurisdictions have bans that would be overridden by HM-164, which jurisdictions would, if HM-164 were applied, face those dangers presented by high-consequence accidents in densely populated urban areas that DOT inadequately considered, and which jurisdictions present alternatives to truck transport that, under the standards elaborated above, DOT must study but did not.²² In these circumstances, no injunction could be

²² The parties have made several suggestions for defining "densely populated urban area," but none is supported by sufficient infor-

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framed that would meet the specificity requirements of Federal Rule of Civil Procedure 65. The need for technical expertise, moreover, and the legitimate goal of national regulation both support giving DOT the opportunity to

(Footnote continued from preceding page)

mation to warrant adoption. The State and City have sought to enjoin application of HM-164 to all cities on the list published by the Nuclear Regulatory Commission in *Physical Protection of Shipments of Irradiated Reactor Fuel* (1980) (NUREG-0561, Revision 1). Letter from New York State, Ex. J (March 22, 1982). The cities on that list, however, are places where special safety precautions were thought to be needed, not where shipments should be banned. That the list should not determine application of HM-164 is most strongly evidenced by the possibility that use of the list, so far as the record reflects, might effectively preclude use of the interstate highway system where no alternative but use of secondary roads is available, a result validly found by DOT to be less safe than highway transport. Similarly, the suggestion of DOT and defendant-intervenors that the Court's injunction apply to all cities with population densities of at least 20,000 people per square mile should be rejected. Those who suggest the figure themselves concede that it is arbitrary, and it does not take careful account of the full range of information available to DOT (including, for example, analysis of the need for buffer zones around densely populated areas). The sources and arguments relied on by all parties should, of course, be considered by DOT in determining the application of HM-164 case by case. Given the complexity of the problem, however, it is inappropriate for this Court to preclude DOT from using its expertise and resources to develop a more informed and carefully tailored remedy. This is not meant to suggest that DOT could not choose to utilize the standard that it has asked the Court to incorporate into the final judgment; the agency has considerable latitude in approaching this problem, and the population density suggested may well be reasonable. See Affidavit of Lawrence B. Shappert, Proposed Order & Judgment of Defendant.

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determine initially what nonfederal bans it must respect in light of the inadequacies underlying its Final Rule.

A more appropriate procedure is to permit a nonfederal jurisdiction with a ban on highway transport of large-quantity radioactive materials to apply to DOT for a ruling that its ban is not overridden by HM-164 because the inadequacies detailed in this opinion render application of the Rule to that jurisdiction invalid. Such a jurisdiction should show that application of the Final Rule might result in truck transport through areas that present dangers of high-consequence accidents similar in degree to those presented in this case by New York City. The jurisdiction should also present evidence of an alternative to truck transport that, like barging in New York City, might be feasible and sufficiently safer than trucking to require DOT consideration under NEPA and HMTA. These two showings should be reasonably comparable in detail to those made by New York City, but under NEPA and HMTA the burden of investigation and analysis lies with DOT. Once the jurisdiction claiming exemption from HM-164 makes the threshold showings that overriding its ban would result in trucking of large-quantity radioactive materials through areas within the range of population densities for which DOT's consideration of high-consequence accidents was inadequate, and that an alternative to trucking exists that, from the evidence available, appears to be feasible and potentially safer than trucking, DOT must then permit the nonfederal ban to remain in effect while it undertakes the further analysis required to correct the weaknesses in HM-164 and thus to justify application of its Final Rule. In all other respects the Final Rule may be enforced unless and until its enforcement

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is enjoined on some ground other than those considered in this litigation.²³

SO ORDERED.

Dated: New York, New York
May 5, 1982 [*]

s/ CHARLES L. BRIEANT

U.S.D.J.

Signed at the request of
Abraham D. Sofaer, United States
District Judge, in his absence, in
my capacity as Part I Judge. See
Rule 5(2) of the Rules for Division
of Business S.D.N.Y.

²³ The judgment in this case does not resolve the dispute that has arisen between the City and DOT concerning the status of the City's regulation of large-quantity shipments from points within the City. The City's position appears to be that such shipments have not been banned but have only been subject to various safeguards, including escort prenotification restrictions. See Letter to Court from Stephen P. Kramer at 3 (April 2, 1982). DOT indicated in its rulemaking that such restrictions are preempted, but portions of this opinion arguably undermine the bases for DOT's position. The issue has not been briefed or argued by the parties, however, and is therefore not ripe for decision. Moreover, neither party has provided any reason why resolution of this matter should not be deferred until after the underlying issues have been definitively resolved, and after the parties have attempted to accommodate their remaining differences.

[*] Filed May 6, 1982.

APPENDIX D

Notice of Appeal for Appellant City of New York

UNITED STATES COURT OF APPEALS

For the Second Circuit

NOTICE OF APPEAL

Docket Nos. 82-6094 and 82-6200

THE CITY OF NEW YORK,

Plaintiff-Appellee,

and

THE STATE OF NEW YORK, ET AL.,

Plaintiffs-Intervenors-Appellees,

v.

**THE UNITED STATES DEPARTMENT OF
TRANSPORTATION, ET AL.,**

Defendants-Appellants,

and

COMMONWEALTH EDISON COMPANY, ET AL.,

Defendants-Intervenors-Appellants.

Appendix D

Sirs:

NOTICE IS HEREBY GIVEN that the City of New York hereby appeals to the United States Supreme Court from the order of the United States Court of Appeals for the Second Circuit herein dated and filed in the office of the Clerk of said Court of Appeals on August 10, 1983, which reversed the May 6, 1982 judgment of the District Court for the Southern District of New York appealed from and remanded the case with instructions to enter judgment upholding Department of Transportation Regulation HM-164 and this appeal is taken from each and every part of said order as well as from the whole thereof.

Dated: New York, N.Y.

August 19, 1983 [*]

Yours, etc.,

FREDERICK A.O. SCHWARZ, JR.

Corporation Counsel

Attorney for The City of New York

Office & P. O Address

100 Church Street

New York, NY 10007

By: LEONARD KOERNER

Assistant Corporation Counsel

[*] Filed on August 19, 1983.

Appendix D

TO:

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Clerk
United States Court of Appeals
For the Second Circuit

APPENDIX E

Notice of Appeal for Appellant State of New York

UNITED STATES COURT OF APPEALS

For the Second Circuit

NOTICE OF APPEAL

Docket Nos. 82-6094 and 82-6200

THE CITY OF NEW YORK,

Plaintiff-Appellee,

and

THE STATE OF NEW YORK, ET AL.,

Plaintiffs-Intervenors-Appellees,

v.

THE UNITED STATES DEPARTMENT OF
TRANSPORTATION, ET AL.,

Defendants-Appellants,

and

COMMONWEALTH EDISON COMPANY, ET AL.,

Defendants-Intervenors-Appellants.

Appendix E

Sirs:

PLEASE TAKE NOTICE that the State of New York hereby appeals to the United States Supreme Court from the order of the United States Court of Appeals for the Second Circuit herein dated and filed in the office of the Clerk of said Court of Appeals on August 10, 1983, which reversed the May 6, 1982 judgment of the District Court for the Southern District of New York and remanded the case with instructions to enter judgment upholding Department of Transportation Regulation HM-164, and this appeal is taken from each and every part of said order as well as from the whole thereof.

Dated: New York, New York
August 31, 1983 [*]

Yours, etc.,

ROBERT ABRAMS

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Appendix E

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United States Court of Appeals
For the Second Circuit

APPENDIX F

**Resolution Adopted January 15, 1976 Amending the
New York City Health Code**

**HEALTH SERVICES ADMINISTRATION
DEPARTMENT OF HEALTH**

Resolution Adopted

**AT A MEETING OF THE BOARD OF HEALTH OF
THE DEPARTMENT OF Health held January 15,
1976, the following resolution was adopted:**

Resolved, that section 175.111 of the New York City Health Code, as repealed and reenacted by resolution adopted on the fifteenth day of November, nineteen hundred seventy-three and filed with the City Clerk on the twentieth day of November, nineteen hundred seventy-three, be and the same hereby is amended by adding a new subsection (1) thereto, to follow subsection (k) thereof, to be printed together with explanatory notes, to read as follows:

(1) Notwithstanding the foregoing provisions of this section, a Certificate of Emergency Transport issued by the Commissioner or his designated representative shall be required for each shipment, to be transported through the City or brought into the City, of any of the following materials:

- (1) Plutonium isotopes in any quantity and form exceeding two grams or 20 curies, whichever is less;
- (2) Uranium enriched in the isotope U-235 exceeding 25 atomic per cent of the total uranium con-

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tent in quantities where the U-235 content exceeds one kilogram;

(3) Any of the actinides (i.e., elements with atomic number 89 or greater) the activity of which exceeds 20 curies;

(4) Spent reactor fuel elements or mixed fission products associated with such spent fuel elements the activity of which exceeds 20 curies; or

(5) Any quantity of radioactive material specified as a "Large Quantity" by the Nuclear Regulatory Commission in 10 CFR Part, 71, entitled "Packaging of Radioactive Material for Transport."

NOTES: Subsection (1) was added by resolution adopted on January 15, 1976 to require the approval of the Commissioner or his designated representative through the issuance of a Certificate of Emergency Transport for the transport or the bringing into this City of specified large quantities of plutonium enriched uranium and other actinides and spent reactor fuel elements which would present a great hazard to public health in this densely and highly populated City. It is intended that such Certificate will be issued for the most compelling reasons involving urgent public policy or national security interests transcending public health and safety concerns and that economic consideration alone will not be acceptable as justification for the issuance of such Certificates. Such Certificates are also intended to be issued for hectocurie and kilocurie cobalt-60 and cesium-137 teletherapy sources employed in therapeutic radiology and biomedical research or educational purposes and for medical devices designed for individual human application (e.g., cardiac pacemakers) con-

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taining plutonium-238, promethium-147 or other radioactive material. This subsection is not intended to apply to small quantities of specified radioactive materials intended for therapeutic radiology and biomedical research or educational purposes.

Resolved, further, that subsection (c) of section 175.111 of the New York City Health Code, as repealed and reenacted by resolution adopted on the fifteenth day of November, nineteen hundred seventy-three and filed with the City Clerk on the twentieth day of November, nineteen hundred seventy-three, be and the same hereby is amended, to be printed together with explanatory notes to read as follows:

(c) This section shall not apply to radiation sources shipped by or for the United States Government for military or national security purposes or which are related to national defense. Nothing herein shall be construed as requiring the disclosure of any defense information or restricted data as defined in the Atomic Energy Act of 1954 and the Energy Reorganization Act of 1974, as amended.

NOTES: Subsection (c) was amended by resolution adopted on January 15, 1976 to conform its provisions with subsection (1) adopted by the same resolution.

Resolved, further, that this resolution shall take effect immediately.

A true copy.

PATRICIA J. CARUSO,
Acting Secretary.

APPENDIX G

**Excerpt from the Department of Transportation
Order 5610.1C**

DEPARTMENT OF TRANSPORTATION

Office of the Secretary
Washington, D.C.

ORDER

Dec-1

DOT 5610.1C

9-18-79

**SUBJECT: PROCEDURES FOR CONSIDERING
ENVIRONMENTAL IMPACTS**

INTRODUCTION

1. **PURPOSE.** This Order establishes procedures for consideration of environmental impacts in decision making on proposed Department of Transportation (DOT) actions. The Order provides that information on environmental impacts of proposed actions will be made available to public officials and citizens through environmental impact statements, environmental assessments or findings of no significant impact. These documents serve as the single vehicle for environmental findings and coordination.
2. **CANCELLATION.** DOT 5610.1B, PROCEDURES FOR CONSIDERING ENVIRONMENTAL IMPACTS, dated September 30, 1974.

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3. **AUTHORITY.** This Order provides instructions for implementing Section 102(2) of the National Environmental Policy Act of 1969, as amended, (42 USC 4321-4347, hereinafter "NEPA") and the Regulations for Implementing NEPA issued by the Council on Environmental Quality, 11-29-78 (40 CFR 1500-1508); Sections 2(b) and 4(f) of the Department of Transportation Act of 1966 (49 USC 1653, hereinafter "the DOT Act"); Sections 309 and 176 of the Clean Air Act, as amended (42 USC 7401 et seq.); Section 106 of the National Historic Preservation Act of 1966 (16 USC 470, hereinafter "the Historic Preservation Act"); Sections 303 and 307 of the Coastal Zone Management Act of 1972 (43 USC 1241); Section 2 of the Fish and Wildlife Coordination Act (16 USC 661 et seq.); Section 7 of the Endangered Species Act, as amended (16 USC 1533); the Federal Water Pollution Control Act, as amended (33 USC 1314 et seq.); Executive Order 12114, Environmental Effects Abroad of Major Federal Actions; and various Executive Orders relating to environmental impacts. In addition, the Order provides instructions for implementing, where environmental statements are required, Sections 138 and 109 of Federalaid highway legislation (Title 23, USC, hereinafter "the Highway Act"); Section 16 and 18(a) of the Airport and Airway Development Act of 1970 (49 USC 1716, 1718, hereinafter "the Airport Act"); and Section 14 of the Urban Mass Transportation Act of 1964 (49 USC Section 1601 et seq., hereinafter "the Urban Mass Transportation Act").

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1. BACKGROUND.

The National Environmental Policy Act (NEPA) establishes a broad national policy to promote efforts to improve the relationship between man and his environment. NEPA sets out certain policies and goals concerning the environment and requires that to the fullest extent possible, the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with those policies and goals.

Section 192 of NEPA is designed to insure that environmental considerations are given careful attention and appropriate weight in all decisions of the Federal Government. Section 102(2)(C) requires that all agencies of the Federal Government shall

include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on—

- (i) the environmental impact of the proposed action,
- (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
- (iii) alternatives to the proposed action,
- (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

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- (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Section 102(2)(A) requires all agencies of the Federal Government to "utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and decision making which may have an impact on man's environment . . ."

The Council on Environmental Quality (CEQ) issued regulations for implementation of the procedural provisions of NEPA (40 CFR Parts 1500-1508) on 11-29-78. The CEQ regulations apply uniformly to and are binding upon all Federal agencies, and direct each agency to adopt implementing procedures which relate the CEQ regulations to the specific needs of that agency's programs and operating procedures.

This Order implements the mandate of NEPA, as defined and elaborated upon by CEQ's regulations, within the programs of the Department of Transportation. The Order is not a substitute for the regulations promulgated by CEQ, nor does it repeat or paraphrase the language of those regulations. Rather, the Order *supplements* the CEQ regulations by applying them to DOT programs. Therefore, all operating administrations and Secretarial Offices shall comply with both the CEQ regulations and the provisions of this Order. This Order provides instructions for implementation of relevant environmental laws and executive orders in addition to NEPA. The environmental process established by this Order is intended to implement the Department's policy objective of one-stop environmental

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processing. To the maximum extent possible, a single process shall be used to meet requirements for environmental studies, consultations and reviews.

POLICY AND INTENT.

- a. It is the policy of the Department of Transportation to integrate national environmental objectives into the missions and programs of the Department and to:
 - (1) avoid or minimize adverse effects wherever possible;
 - (2) restore or enhance environmental quality to the fullest extent practicable;
 - (3) preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites;
 - (4) preserve, restore and improve wetlands;
 - (5) improve the urban physical, social and economic environment;
 - (6) increase access to opportunities for disadvantaged persons; and
 - (7) utilize a systematic, interdisciplinary approach in planning and decision making which may have an impact on the environment.
- b. The purpose of the environmental procedures in this Order is to provide Department officials, other decision makers, and the public, as part of the decision making process, with an understanding of the potential effects of proposed actions significantly affecting the quality

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of the human environment. The environmental review process is to be used to explore and document alternative actions that will avoid or minimize adverse impacts.

- c. The environmental impact statement (EIS), finding of no significant impact (FONSI, formerly "negative declaration") and determination that a proposed action is categorically excluded serve as the record of compliance with the policy and procedures of NEPA and the policy and procedures of other environmental statutes and executive orders. To the maximum extent possible, all environmental studies, reviews and consultations shall be coordinated into a single process, and compliance with all applicable environmental requirements shall be reflected in the EIS or FONSI.

3. *PLANNING AND EARLY COORDINATION*

- a. The identification and evaluation of the social, economic and environmental effects of a proposed action and the identification of all reasonable measures to mitigate adverse impacts shall be initiated in the early planning stages of the action, and shall be considered along with technical and economic studies. Assessment of environmental impacts should be a part of regional transportation system planning and broad transportation program development.

General criteria for identification of social, economic, and environmental impacts in DOT planning programs are set forth in subparagraph 10.e., DOT 1130.4, International Planning Groups and Unified Planning Work Programs, of 2-12-79. Other guidance may be identified in the implementing procedures of the administrations.

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- b. Where the DOT action is initiated by a State or local agency or a private applicant, the responsible operating administration shall assure that the applicant is advised of environmental assessment and review requirements and that consultation with appropriate agencies and interested parties is initiated at the earliest possible time. (See paragraph 20.b. below.)
- c. Existing administration procedures for early consultation and citizen participation shall be modified to incorporate the scoping process (CEQ 1501.7). Implementing procedures shall assure that significant issues are identified and that all interested parties have an opportunity to participate in the scoping and early consultation process.
- d. Where the proposed action is initiated by a State and may have significant impacts on a Federal land management entity or any other State, the responsible Federal official shall provide early notice to and solicit the views of that Federal land management entity or other state.

4. ENVIRONMENTAL PROCESSING CHOICE.

- a. *Actions covered.* Except as provided in subparagraph c. below, the requirements of this Order apply to, but are not limited to, the following: all grants, loans, loan guarantees, construction, research activities, rulemaking and regulatory actions, certifications, licenses, permits, approval of policies and plans (including those submitted to the Department by State or local agencies), adoption or implementation of programs, legislation proposed by DOT, and any renewals or reapprovals of the foregoing. (CEQ 1508.18(b).)

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- b. *Environmental Impact Statements.* An EIS shall be prepared for any proposed major Federal action significantly affecting the environment. (See also: CEQ 1508.27, and paragraphs 7 and 20 of this Order.)
- c. *Categorical Exclusions.* The following actions are not Federal actions with a significant impact on the environment, and do not require either an environmental assessment or an environmental impact statement:
- (1) Administrative procurements (e.g. general supplies) and contracts for persons services;
 - (2) Personnel actions (e.g. promotions, hirings);
 - (3) Project amendments (e.g. increases in costs) which do not significantly alter the environmental impact of the action;
 - (4) Operating or maintenance subsidies when the subsidy will not result in a change in the effect on the environment; and
 - (5) Other actions identified by the Administrations as categorical exclusions pursuant to paragraph 20.
- d. *Environmental Assessment.* An environmental assessment is a document concisely describing the environmental impacts of a proposed action and its alternatives. If a decision has not been made to prepare an EIS and a proposed action has not been classified as a categorical exclusion, an environmental assessment shall be prepared. The results of an environmental assessment shall be used to determine whether an EIS or PONSİ shall be prepared. (See CEQ 1508.9 and 1506.5(b).)

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- e. *Finding of No Significant Impact (FONSI)*. If it is determined following preparation of the environmental assessment that the proposed action will not have a significant impact on the environment, a FONSI shall be prepared. (See paragraph 5.)

5. *FINDING OF NO SIGNIFICANT IMPACT.*

- a. The FONSI may be attached to an environmental assessment or the environmental assessment and FONSI may be combined into a single document.
- b. Except as provided in subparagraph c. below, a FONSI or environmental assessment need not be coordinated outside the originating office, but must be made available to the public upon request. Notice of availability shall be provided (see suggestions for public notice in CEQ 1506.6(b)). In all cases, notice shall be provided to State and areawide clearinghouses.
- c. In the circumstances defined in CEQ 1501.4(e)(2), a copy of the proposed finding of no significant impact and the environmental assessment shall be provided to the Assistant Secretary for Policy and International Affairs (P-1), and the documents should be made available to the public for a period of not less than 30 days before the finding of no significant impact is made and the action is implemented. Consultation with other Federal agencies concerning section 4(f) of the DOT Act, the Historic Preservation Act, section 404 permits, and other Federal requirements should be accomplished prior to or during this period.

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